

**Doctoral Candidates' Information Practice through
Research Writing: Cases of East-Asian Students in
Australian Universities**

Jiadong Liao

Bachelor of Arts (International Business and Communication Studies, 2009)

University of Nottingham (Ningbo)

Master of Education (2011)

University of Western Sydney

A thesis submitted in fulfilment of the requirements for the degree of

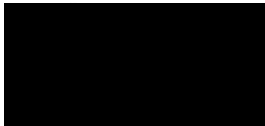
Doctor of Philosophy

University of Western Sydney

August, 2015

STATEMENT OF AUTHENTICATION

The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for a degree at this or any other institution.



.....
Jiadong Liao

25 August, 2015

Dedicated to my family, especially to my father

Contents

Abstract.....	v
List of Tables	viii
List of Figures.....	viii
Acknowledgements.....	ix
Key Concepts	xi
List of Abbreviations	xiii
Chapter 1 Information Practices in Research Writing	1
1.0 Introduction	1
1.1 Background to the research problem	2
1.2 Research questions and significance	5
1.3 Theoretical and methodological previews	7
1.4 Thesis statement.....	9
1.5 Outline of the thesis	9
1.5 Conclusion	12
Chapter 2 Information Practices in Higher Education	14
2.0 Introduction	14
2.1 Challenges and problems of information practices in academia	14
2.2 LIS strategies in information practices	16
2.3 Writing strategy as a major response in research education	18
2.3.1 The “Community of Practice” view	18
2.3.2 The “Genre” view	20
2.3.3 “Structure linking to content” perspective.....	21
2.4 Bringing “writing” and “information practices” together	21
2.4.1 Literature review studies in research education.....	22
2.4.1.1 Literature use in a whole thesis	22
2.4.1.2 Literature coverage: From objective to subjective	25
2.4.1.3 A holistic approach to literature review	30
2.4.2 Information Literacy Frameworks and scholarship in LIS	37
2.4.2.1 The essence of information practices	41
2.4.2.2 The key concepts in information practices	48
2.5 Conclusion of the chapter	51
Chapter 3 A Foucauldian Discursive Approach to Investigating Information Practices in Research Writing.....	53
3.0 Introduction	53
3.1 Where Foucauldian Discourse Analysis fits	53
3.2 The “discourse” concept	55
3.3 The Horizontal aspect of Foucauldian discourse.....	57
3.4 Vertical aspect of the discourse Foucauldian “statement”	62

3.4.1 Statement – a function of existence	63
3.4.1.1 Statement – the rule of a referential.....	65
3.4.1.2 Statement – the rule of a subject.....	65
3.4.1.3 Statement – the rule of an associated field	67
3.4.1.4 Statement – the rule of materiality	68
3.4.2 The four directions of discursive formations.....	71
3.4.2.1 Statement to form objects	73
3.4.2.2 Statement to form enunciative modalities	74
3.4.2.3 Statements to form concepts.....	75
3.5 Conclusion	77
Chapter 4 Mapping an Analytical Tool of Information Practices.....	79
4.0 Introduction	79
4.1 A general review of qualitative research approaches.....	79
4.2 Positioning the research approach within Discourse Analysis	82
4.3 Research principles.....	85
4.3.1 Validation of the study.....	85
4.3.2 Generalisability	86
4.3.3 Ethical considerations	87
4.4 Data collection.....	87
4.5 Data analysis	89
4.5.1 A working framework for data analysis	90
4.5.1.1 Objects of information practices.....	91
4.5.1.2 Enunciative modalities of information practices	95
4.5.1.3 Concepts in information practices	100
4.5.2 Data analysis procedures	109
4.5.2.1 Identifying and naming the data	109
4.5.2.2 Grouping the data	109
4.5.2.3 Approaching the data in two dimensions.....	111
4.5.2.4 Describing the data	112
4.5.2.5 Memoing the data	113
4.6 Conclusion	115
Chapter 5 Information Practices on Subject Vocabularies	116
5.0 Introduction	116
5.1 The analysis of literature coverage in the data	116
5.1.1 Macro analysis of the data	116
5.1.1.1 Analysis of breadth-topicality.....	120
5.1.1.2 Analysis of currency	121
5.1.1.3 Analysis of comprehensiveness	124
5.1.1.4 The summary of macro-level analysis.....	125
5.1.2 Micro-level analysis: Literature coverage at the field and topic levels ...	126
5.1.3 Reconsidering macro- and micro-level analysis on literature coverage ..	129
5.1.4 A short summary on literature coverage.....	134
5.2 The analysis of literature use in the data.....	135

5.2.1 The objects of literature use demonstrated in the data	136
5.2.1.1 Various forms of contextual information used in the data	137
5.2.1.2 Various forms of content information in the data	140
5.2.2 The enunciation of literature use	143
5.2.3 The concepts of information practices	147
5.3 Conclusion of the chapter	154
Chapter 6 Information Practices on Phenomena and Variables	156
6.0 Introduction	156
6.1 The analysis of literature coverage in the data	156
6.1.1 Macro-level analysis of literature coverage	156
6.1.1.1 Analysis of breadth-topicality	157
6.1.1.2 Analysis of currency	159
6.1.1.3 Analysis of comprehensiveness	160
6.1.2 Micro-level analysis of literature coverage	161
6.1.2.1 Field and historical coverage in the phenomena and variables	163
6.1.2.2 Subjective and objective approaches to coverage	164
6.2 The analysis of literature use	166
6.2.1 The objects involved in phenomena and variables	166
6.2.2 The enunciation of literature phenomena and variables	170
6.2.2.1 The interpreting subject position	171
6.2.2.2 Synthesising subject position	172
6.2.3 The concepts operating in the literature on phenomena and variables	176
6.2.3.1 Concept of relevance	176
6.2.3.2 Concept of coherence	178
6.2.3.3 Other concepts	181
6.3 Conclusion of the chapter	183
Chapter 7 Information Practices on Method-Related Information	185
7.0 Introduction	185
7.1 A general analysis of method information in the data	185
7.2 Discursive objects relevant to method information	188
7.2.1 Method information relating to research focus	189
7.2.2 Method information relating to research design	192
7.2.3 Method information relating to the research context	195
7.2.4 Method information relating to research process and result	199
7.3 The enunciation of method-related literature use	203
7.3.1 Summarising and synthesising subject positions	203
7.3.2 Comparing subject positions	206
7.3.3 Evaluating subject	208
7.3.4 Integrating subject	212
7.4 The concepts of information practices	214
7.4.1 Concept of relevance	214
7.4.2 Concept of coherence	216
7.4.3 Concept of criticality	219

7.4.4 Concept of creativity.....	220
7.4.5 Concept of “Research as Inquiry”	222
7.5 Conclusion of the chapter	224
Chapter 8 Conclusion	225
8.0 Introduction	225
8.1 Thesis statement.....	225
8.2 Revisiting research questions	226
8.2.1 Information practices in the Foucauldian discourse	228
8.2.2 Interpreting Asian PhD students’ information practices.....	230
8.2.2.1 The review of subject vocabularies and topics	231
8.2.2.2 The review of research phenomena and variables	234
8.2.2.3 The review of method-related information.....	236
8.2.3 Reconceptualising information practices	238
8.3 Implications for future studies	240
8.4 Final comments	242
References	244
APPENDIX I	263
APPENDIX II.....	271
APPENDIX III	278
APPENDIX IV.....	282
APPENDIX V	283

Abstract

Information practices are pertinent to research writing, particularly in the writing of a literature review. This study examined East Asian doctoral (PhD) candidates' information practices as a construct in writing literature reviews for social science theses in Australian universities. The outcomes of this research complement and extend the current documented strategies and regulations in information practices in both fields of Higher Degree Research education and Library and Information Science (LIS). Conceptualised in terms of Foucauldian (1972) "statements", this study contributes to a reconceptualisation of information practices in research writing through the analysis of students' literature reviews. Further, this research sheds light on research pedagogy for researchers who are committed to being educators more than supervisors. For doctoral students this thesis provides in part a picture of information practices in research writing.

Information practices in literature reviews have largely been under-researched and/or overlooked in the fields of LIS and research education. Past studies in these two areas have contributed to developing research students' information search abilities and writing abilities through various strategies (Carter, 2011a; Cotterall, 2011a; Kavuluru et al., 2012; Lee & Kamler, 2008; McCulloch et al., 2010; Olsson, 2010; Switzer & Lepkowski, 2007), while there is lack of combined investigation about information practices in research writing. Moreover, there are few studies investigating the *statements* (Foucault, 1972) *per se* in these two areas. Statement which is the core unit of discourse brings about the particular modalities of existence such as the information practices in research writing (Foucault, 1972). The investigation on statement can generate new insights into research writing by relating to information practices in both research education and LIS.

The data collection and analysis for this study, therefore, was conducted using Foucault's (1972) "*statement*". This thesis began by reviewing various works on information practices in both research education and LIS to develop a working theorised framework for use in data collection and analysis. This framework was further developed through Foucault's (1972) ideas on the formation of objects, the formation of enunciative modalities, and the formation of concepts. Accordingly, the objects and elements in a literature review have been restructured, the ways to write a literature review in accordance with these objects have been explored, and relevant concepts used to inform the construction of a literature review have been reconfigured. This framework was tested through the data analysis on seven East Asian PhD students' literature reviews. These theses were written by East Asian PhD students who completed doctorates within the last ten years (2007-2011) in social sciences at Australian universities. Specifically, this study examined literature "coverage" and "use" in three areas of these PhD students' literature reviews, namely the review of subject vocabularies and topics; the review of research phenomena and variables, and the review of method-related information.

A topic-based formulation of a literature review was proposed as the original contribution to knowledge made by this research. This formulation is composed of three key aspects. First, it is recommended that a comprehensive literature review includes discursive objects that are relevant to the review of subject vocabularies and topics, research phenomena and variables, and method-related information. Second, a sound literature review requires doctoral students to occupy many interrelating enunciative positions to speak about the objects in the review. Third, it is recommended that the key concepts of "relevance", "coherence", "criticality", and "creativity" should be operationalised in pedagogies for the formulation of a literature review as a whole.

As a consequence of the research reported in this thesis, it is possible to offer an alternative perspective to that of research writing by conceiving research students'

information practices in literature review writing. Pedagogically, this can prompt research students to ask probing questions about their information practices such as: “What things do I need to include in a literature review?” “How do I write about these things?” “Why do I have to write these things in this way rather than that way?” The overarching perspective on information practices in research writing explored in this thesis deepens and extends the present work on information practices in the areas of research education and LIS.

Key words: information practices; literature review; discourse (statement); research education

List of Tables

Table 5.1 Information about the selected PhD theses	118
Table 5.2 Data on literature coverage for subject vocabularies and topics	119
Table 5.3 Research topic/s and supporting topics involved in the data	131
Table 6.1 Data on literature coverage for phenomena and variables	157
Table 7.1 Method information in the data	186
Table A-1 Literature Review Scoring Rubric.....	282

List of Figures

Figure 2.1 Examiner expectation on literature coverage and use	22
Figure 2.2 The levels of literature coverage and synthesis	33
Figure 3.1 A schemata of statement	77
Figure 4.1 Types of Discourse Analysis.....	83
Figure 4.2 A working framework of information practices.....	90
Figure 4.3 Attributes constituting literature coverage.....	93
Figure 4.4 Attributes constituting literature use	93

Acknowledgements

In the past four years, I have been helped and supported by so many people who have kept me staying on the road to the finishing line. I could not make it without all of you. However, it is difficult to remember everyone who has helped in this long journey. So I apologise if your name is not included here.

First, I must thank my principal supervisor and research educator, Dr. Jinghe Han. Thank you for your understanding or at least disguising your despondency with my return to China for a while to deal with personal issues. I apologise for my leave. There have been some hard times, and without your patient talks with me in your office, at McDonald's, across borders, and online through videos and emails, I could not have worked my way through it. You provided me with great intellectual freedom and encouragement to immerse myself in my areas in trying out ideas across disciplines. When I got stuck, you were always the person who pulled me back to the safe zone and gave me necessary advice that magically turned this thesis into a living and lively project of the mind. I really appreciate your constant help.

Thank you also to Professor Michael Singh for being a powerful associate supervisor for fuelling me with much confidence and making me less panic. To the team at UWS, thank you Xiafang Chen, Xinghui Jin, Jing Qi, Hui Meng, Yiye Lu, Linan Yao, Yonggui Jin, Binyi Li, Manh Thang Tran, Wayne Sawyer, Joanne Orlando, Allen White, Chwee Beng Lee, Nicolette Pearson, Kathy Melgar, Linda Lamond, and Markie Lugton who each made their own impression on me and influenced my work in different ways.

Away from UWS, I must thank Ye Gong, Sven Wilms (aka. Dennis Abbott), David Silverman, Steven Stanley, Linda Graham, Michael Olsson, Phan Le Ha, and Muriel Wells who either spent the time talking with me or inspired me with your great work.

Thank you to my house mates and the neighbours in the Computing Science geeks' house for a memorable life, wonderful discussions, and many laughs with you all. I also would like to thank the many friends that I have neglected over the years. Thank you for not forgetting me and constantly expecting me back home ASAP!

A special word of thanks to my wife Jing Yuan for your “eternal sunshine of the spotless mind”. Thank you for being so patient in waiting for me to return home and for understanding my intellectual passion, even though I do not deserve your support.

Last, but certainly not least, my greatest gratitude goes to my family. My father Xinrong Liao, father-in-law Kaifang Yuan, mother Zhihua Chen, mother-in-law Aihua Jiang, my sister Chenxia Liao, brother-in-law Weiliang Chen, and my niece Xinmiao Chen. All of you kept faith in me. You have given me so much emotional and financial support over the many years which I greatly appreciate. While I have been educating myself, it would not have been possible to finish the thesis without you all.

Key Concepts

Discourse

For Foucault (1972) discourse is the fundamental medium for action that brings an object into being. In a general sense, discourse is considered as a group of various texts including talk, written texts, nonverbal interactions, symbols, and artefacts. In a theoretical sense, discourse is constituted by a group of sequences of signs, in so far as they are statements, that is, in so far as they can be assigned particular modalities of existence.

Higher Education

Higher education refers to education provided by institutions such as universities and polytechnic college institutions. Two important components of higher education which are the focus of this thesis are Higher Degree Research (HDR) Education (research education for short) and Library and Information Science (LIS for short). The former refers to education dedicated to forming, informing and transforming Higher Degree Research students. The latter concerns their information seeking behaviour necessary to their task of producing original knowledge in academia.

Information practices

Information practices are relevant to how HDR candidates gather information to establish the current knowledge base for research to be reported in a thesis or other vehicle for disseminating new knowledge. These include practices of information search, inclusion, synthesis, evaluation, quotation, paraphrasing, and summarising. This study investigates the information practices relevant to HDR students' research writing, specifically the writing of the literature review.

Literature coverage

A key information practice concerns the scope of literature used in the literature review, theory, and methodology chapters. This practice is not concerned with how individuals search literature, but refers to the repertoire of literature they have already searched and decide to make use of in their thesis. Hence, this practice comes after information search.

Literature use

Literature use is an information practice, which refers to how individual HDR candidates interact with the literature in producing their thesis.

Statement (Foucault)

For Foucault (1972) a statement is neither a sentence or a proposition or a speech act. A statement is a function of enunciation that accords names to certain objects, defines particular ways to talk about particular things and interprets particular concepts. A “statement” refers to these processes of enunciation. A statement is:

[T]he modality of existence proper to that group of signs: a modality that allows it to be something more than a series of traces, something more than a succession of marks on a substance, something more than a mere object made by a human being; a modality that allows it to be in relation with a domain of objects, to prescribe a definite position to any possible subject, to be situated among other verbal performances, and to be endowed with a repeatable materiality (Foucault, 1972, p. 120).

List of Abbreviations

HDR student	Higher Degree Research student
LIS	Library and Information Science

Chapter 1

Information Practices in Research Writing

1.0 Introduction

This thesis documents a study of East Asian PhD students' information practices in research writing, specifically in writing literature reviews. The scholarly interests driving this study of the information practices of Higher Degree Research students (HDR or research students) from East Asia are twofold. First, the researcher himself is a Chinese PhD candidate pursuing postgraduate studies in Australia. This commonality with the cohort prompted contemplation of the attributes an Asian postgraduate requires for a successful international learning experience. Second, academic writing, particularly thesis writing for higher degrees, is increasingly reliant on individuals' information competencies due to the technological advances associated with the dynamic information exchanges in western academia (Fleming-May, 2009; Nicholas et al., 2009; Switzer & Perdue, 2011). Asian students experience the double challenges of a culturally different academic environment and the “overload” of scholastic information (Abasi & Graves, 2008; Liu & Winn, 2009; Tardy, 2005). The research reported in this thesis addressed these concerns by examining East Asian PhD students' (n=7) literature reviews, one of the key areas of student interaction with information involved in the research writing required for producing a thesis. This investigation is beneficial not only to East Asian research students, but also offers insights into research writing for research educators in higher education institutions.

The first chapter provides the background of the study. It introduces the research problem by identifying debates in the current research literature and discusses the significance of this particular research project. The conceptual framework and research methods are then briefly introduced. This chapter concludes with an outline of each chapter in this thesis.

1.1 Background to the research problem

This study is situated in higher education with respect to HDR students. It first explored the characteristics of research education in terms of its educational goals and the specific manifestations of these goals. Research degree programs such as the Doctor of Philosophy (PhD) or Masters of Philosophy have two general objectives, namely to educate HDR students to become competent researchers, and to support their contribution to original knowledge to their particular research field. These objectives can be found in university policy statements regarding the PhD degree. The following example is typical in this regard:

The PhD is awarded in recognition of *original, independent and successful* research of *international standard* in the discipline. A PhD candidate should make a *substantial original contribution to knowledge* in the form of *new knowledge* or *significant and original adaptation, application and interpretation of existing knowledge* (University of Western Sydney, 2011, italics added).

In pursuit of these educational goals, there have been concerns raised about accountability and quality in research education (Halse & Malfroy, 2010). With the large number of research students enrolled in the Australian higher education sector¹, for whom English is a second language, assuring quality research education for this cohort is critical. Quality in research education has a strong link with completion and retention rates of international research students, and their overall satisfaction of overseas study (Arambewela & Hall, 2009; Harman, 2002). International research students are recognised as being able to realise their potential to contribute to

¹ Overseas students accounted for 28.1% (enrolments) of all students in the higher education sector of Australia in 2010; 26.7% of research students were international students; in the social science and humanity disciplines, 21% of research students were international students (Department of Education, Employment and Workplace Relations, 2011).

transnational knowledge exchange; developing their competence as researchers through quality research education and advancing Australia as a dynamic international knowledge society (LERU, 2010; Singh, 2010). The research reported in this thesis focused on the research education of this cohort, particularly doctoral students from East Asian countries and regions such as the People's Republic of China (mainland), Hong Kong (SAR), Japan, Singapore, South Korea, Taiwan, and Vietnam. These countries are major sources of international research students undertaking research and study in Australian universities.

Indeed, one of the key elements of quality research education is the development of research capabilities. There is an imperative in HDR education that candidates become competent knowledge producers. Rules governing PhD candidature include statements specifying these practices:

These outcomes may be based on a *comprehensive critical review of literature*, empirical research, creative work or other *systematic approach embedded in a field* or discipline, and/or they may be based on *advanced and sustained critical reflection and analysis* of professional theory and practice. (University of Western Sydney, 2011, italics added)

Aiming to develop such abilities as critically reviewing, reflecting and analysing empirical research and/or theoretical practices engenders an all-round research endeavour in different areas of higher education. In research education, for example, studies into research writing, and literature review writing in particular, are important to the development of research students' capabilities (Boote & Beile, 2005; Holbrook et al., 2007, 2008; Holbrook, 2007). Studies in Library and Information Science (LIS) prescribe general information literacy guidelines and address information search complications faced by users. This thesis peered through a Foucauldian (1972) lens to investigate East Asian PhD students' information practices in the research writing required to produce literature reviews for theses of social sciences.

In research education, research writing programs attempt to develop students' writing skills. Asian students using English as their second language are often the target group in research writing workshops (Hyland, 2007; Paltridge & Starfield, 2007; Pho, 2008). A key premise driving this writing support is to explicate the writing conventions valued by western academic institutions (Carter, 2011a; Hyland, 2007; Kamler & Thomson, 2008; Lee & Kamler, 2008; Pho, 2008). By familiarising themselves with these writing conventions, it is expected that these HDR students will become better research writers and produce quality research reports. However, the emphasis on research writing skills and conventions seems to overlook the importance of information use in producing this writing. The emphasis on writing forms largely neglects the importance of teaching and learning the information literacy skills required to become a successful research writer (Hillocks, 2005). In particular, writing a thesis in the social sciences and humanities involves critically accessing, reviewing, and synthesising information not only in the field of the research focus, but most likely in cross disciplinary areas as well.

Information behaviours in research work are more significant today due to ongoing advances in information and communication technologies. Effectively dealing with voluminous information in modern research work is a significant challenge (Rowlands & Nicholas, 2006). This challenge has received some attention in studies of literature review writing in research education (Holbrook et al., 2007, 2008; Holbrook, 2007). In LIS studies developing information competencies is one of the core research agendas (Bruce, 2001; Bundy, 2004; Catts & Lau, 2008). Specifically, in research education, literature reviews have been studied in terms of the generic process of research synthesis and attributes that constitute a successful literature review (Boote & Beile, 2005; Holbrook et al., 2007). In LIS, many versions of information literacy frameworks have been produced in both the US and Australia to account for the holistic information practices pertinent to research work (ACRL, 2000, 2015; Bundy, 2004). Critically reviewing and synthesising studies and theories to accord with university

prescriptions for the PhD involve developing research students' capabilities in information practices. These practices include information search, evaluation, quotation, paraphrasing, summarising and critical thinking for writing a thesis. These capabilities are particularly important for the literature review, theoretical and methodological chapters of a thesis or research report. The present study investigated the accounts about information practices in both research education and LIS as discourses which inform students' research writings for generating literature reviews.

1.2 Research questions and significance

This study examined information practices in the literature reviews of Asian PhD students. There is one main research question in this study, and three contributory research questions. The main research question is: How can the investigation of information practices provide an alternative perspective towards East Asian PhD students' writing of literature reviews? The contributory questions are:

1. What work in the fields of research education and LIS has been conducted that can be amalgamated to develop a working framework for addressing Asian PhD students' information practices?
2. How do the Asian PhD students address information in literature reviews in light of this working framework?
3. How can these Asian students' information practices as reflected through their literature reviews be reconceptualised through the implications of Foucauldian discourse?

The first contributory research question regards focus on the examination of information practices in both research education and LIS. This work was interpreted through Foucault's (1972) concept of *discourse*, particularly his articulations regarding *statement*. Through this Foucauldian lens, a working framework was developed which represents the present discourse on information practices. This framework was then

used as an analytical tool for addressing the second research question.

In the second research question, the researcher analysed the literature review sections of Asian PhD students' theses. With the support of the above working framework this thesis developed a more complete understanding of Asian PhD students' information practices associated with producing literature reviews. It examined three parts of their information practices in producing a literature review, namely the review of subject vocabularies and topics; the review of research phenomena and variables, and the review of method-related information.

The third contributory question brings to bear reflections on the two prior contributory questions. It reconceptualised the present descriptions of information practices by drawing and elaborating Foucault's (1972) categories relating to discursive formations in terms of objects, enunciative modalities and concepts. This question then sketched research writing through a literature review by having research students answer three questions regarding their information practices: What things do I need to include in a literature review? How do I write about these things to be included? Why do I have to write about these things in this way rather than that way?

Findings generated from the data analysis relating to these research questions offers implications primarily for higher education researchers, especially supervisors. The thesis can also be of interest to other key participants in academics such as librarians and academic literacy advisors. Past studies in both research education and LIS largely focus on describing the complications students face in their information practices (Rowlands & Nicholas, 2006; Switzer & Perdue, 2011; Wang, 2007). In an original contribution to knowledge, this study brings theoretically informed, empirically grounded considerations of information practices together. By conceptualising information practices through Foucault's (1972) theory of discourse, this study provides a new angle from which to perceive the practices of research writing. Specifically, by understanding what and how discourses are operating in a literature

review, research educators such as supervisors, librarians and academic literacy advisors can better understand research students' information practices in research writing. This would enable improved or re-read doctoral research pedagogies. Moreover, this study can be read as a self-guide manual for HDR students or tertiary students in general. It provides theoretically driven, evidence-based practical advice for research writing. This advice can prompt HDR students to better contemplate their practices for ensuring the coverage and use of literature. HDR students may reflect upon their information practices through the discourses about what should necessarily be considered in research writing or a literature review, how to write research, and why. In effect, these considerations may increase novice HDR students' confidence when undertaking a literature review by helping them to say "I know where I'm going and I'm getting there."

1.3 Theoretical and methodological previews

This study was theoretically and methodologically informed by the overarching category of discourse. Discourse is the fundamental medium for action that brings an object into being (Parker, 1992; Potter & Hepburn, 2008). This is not an exception for the information practices which are brought into being through the operation of research writing. According to Foucault (1972), discourse is a key construct required for understanding knowledge, its production and its originality. Basically, knowledge is constructed through discourse imbued with power. However, there is no exact definition for Foucauldian discourse. In a general sense, discourse may be considered as a group of various texts which include talk, written texts, and nonverbal interactions, or symbols and artefacts. Theoretically, discourse is constituted by a group of sequences of signs, insofar as they are statements, that is, insofar as they can be assigned particular modalities of existence. (Foucault, 1972, p. 121)

A core element in Foucauldian discourse is the category "statement". A statement is neither sentence nor proposition nor speech act. A statement is a function of

enunciation that accords names to certain objects, defines particular ways to talk about particular things and interpret particular concepts to describe this enunciation. A statement is the

modality of existence proper to that group of signs: a modality that allows it to be something more than a series of traces, something more than a succession of marks on a substance, something more than a mere object made by a human being; a modality that allows it to be in relation with a domain of objects, to prescribe a definite position to any possible subject, to be situated among other verbal performances, and to be endowed with a repeatable materiality. (Foucault, 1972, p. 120)

Foucault's (1972) categories of discourse and *statement*, are key analytical tools used in this thesis to generate new insights into research writing by relating to information practices in both research education and LIS. To make this study feasible, these conceptual tools were employed in the analysis of the literature reviews of East Asian PhD students' theses.

To draw on statements relevant to information practices, the researcher turned to information literacy research in the field of LIS (ACRL, 2000, 2015; Bundy, 2004), and publications on literature reviews in research education (Boote & Beile, 2005; Bruce, 2001; Holbrook et al., 2007). These otherwise unconnected fields of study works were combined in this study. They were considered together as *statements* to produce a working framework with which to analyse the actual information practices of East Asian PhD students in their literature reviews. This study analysed evidence from seven theses undertaken by Asian PhD students in Australian universities. These HDR students are from different East Asian countries or regions, and their theses were concerned with different areas of research in the social sciences. Data were initially classified into three groups, specifically the review of subject vocabularies and topics; the review of phenomena and variables, and the review of method-related information.

The data were then analysed against the working framework which consists of two parts – literature coverage and literature use. The Coding techniques (Saldana, 2009) were applied to the data including provisional coding, descriptive coding and memo writing.

1.4 Thesis statement

Through the examination of the East Asian PhD students' research writing, specifically their literature reviews, this study proposed a topic-based formulation of literature reviews as a final product of this research. This formulation is composed of three aspects. First, a comprehensive literature review should include discursive objects that are relevant to the review of subject vocabularies and topics, research phenomena and variables, and method-related information. Second, a sound literature review requires doctoral students to occupy many and interrelating enunciative positions to speak about the objects in the review. Third, there should be key concepts such as “relevance”, “coherence”, “criticality”, and “creativity” that are operating in the formulation of a literature review as a whole.

This research offers an alternative perspective from which to perceive the research students' information practices in literature reviews. This new angle prompts research students to ask probing questions about information practices: “what things do I need to include in a literature review?”, “how do I write about these things?” and “why do I have to write these things in this way rather than that way?” This overarching perspective of information practices in literature reviews complements and extends the present works on information practices in the areas of research education and LIS.

1.5 Outline of the thesis

The development of the above argument is advanced through eight chapters. Following this introductory chapter is a literature review chapter, a theoretical chapter, a

methodological chapter, three evidentiary chapters, and a final chapter concludes this thesis. An overview of each chapter follows.

Chapter 2, ironically a literature review, includes two parts. First, it sets the context for this study by reviewing the challenges of information practices in higher education and various responses to the challenges from studies in both research education and LIS. The second part of this chapter reviews publications relevant to research writing, and specifically to writing a literature review, in research education and documents on information literacy in LIS.

In Chapter 3, the theoretical framework for this study is introduced. This study is informed by Foucault's (1972) concept of discourse, specifically the concept of "*statement*". Before introducing *statement*, a brief review is provided of the landscape of contemporary social theories where Foucault's (1972) theory may be found. Foucault (1972) did not provide a specific definition for discourse, although he gave a set of relationships which position this term. This chapter reviews the horizontal aspect of discourse in terms of its relationship with knowledge and power. It also reviews the vertical aspect of discourse in which *statement* is specifically examined in terms of its enunciative functions and discursive formations. It is argued that works about information practices in terms of publications and documents from research education and LIS can be considered as statements in the formation of objects, enunciative modalities, concepts, and strategic choices as pertinent to research writing (Foucault, 1972). The analytic focus on statement is explained in relation to information practices in research writing. The power relations in discourse are not examined in this thesis, and thus constitutes both a delimitation and limitation of this study.

Chapter 4 is concerned with issues of methodology and research methods. It describes this research in terms of Foucauldian (1972) discursive enquiry and positions it in terms of the theoretical and practical considerations of educational research. It provides a brief examination of various research approaches as well as different

analytic focuses on Discourse Analysis. The practical issues relating to this research method including how this study is validated, and generalised, and ethical considerations are explained. This chapter also describes the procedures for data collection and analysis. This includes debates about how sampling methods and data scopes were delimited for this study and how data were named, coded, and rendered through memo writing for data analysis. This chapter also proposes a working framework, as viewed through a Foucauldian (1972) lens, for research writing using information practices. This framework, consisting of literature coverage and use orients the data analysis and presentation in the following three data analysis chapters.

Chapter 5 is the first data analysis chapter. Here, subject vocabularies and topics in literature reviews are analysed. The analysis starts with an interactive macro-micro level examination of literature coverage in the data. It analyses the data using the key concepts of literature coverage and uses a “topic-based” approach to shed light on the complexity of literature coverage. Then, evidentiary excerpts are analysed in terms of specific practices of literature use. Objects of information practices involved in Asian PhD students’ literature reviews are analysed, as well as the enunciative modalities of the information practices, and the overarching concepts operating in the information practices of subject vocabularies and topics.

In Chapter 6, information practices relating to the research phenomena under investigation through the literature reviews are examined. Once again, this analysis focuses on literature coverage and literature use. Likewise, evidence of literature coverage is analysed at the macro- and micro-levels. First, literature coverage is examined using macro-level analytic procedures through which the ground is established for the detailed analysis of characteristic patterns and divergences in literature coverage. The micro-level analysis examines the specifics of research writing in terms of how literature coverage is manifested in individual evidentiary excerpts. As to literature use, there are various types of research phenomena defined as the objects of information practices; various enunciative modalities examined in

relation to these objects of information practices, and various concepts considered when characterising the information practices of phenomena and variables.

Chapter 7 is the last data analysis chapter in this thesis. Its analytic focus is on method-related information in literature reviews. Method-related information is not exclusively limited to methodology chapters. Rather, through the analysis of literature review sections, instances are identified which allude to method-related information. The analysis proceeds from an overview of how method information appears in the data to progressively classify different types of method information as objects belonging to the information practices of method-related information. Then how they are “enunciated” through particular enunciative modalities is examined. Furthermore, the concepts underpinning the practices of method information used to explain why particular enunciative modes are invoked and specific objects are revealed through evidence from the literature reviews.

Chapter 8 concludes this thesis by reflecting upon the research project as a whole. It considers the argument of the thesis that information practices in research writing, and literature reviews specifically, can be understood differently by using a discursive perspective. The research questions are re-examined to test this argument. Findings from this study shed light on doctoral information practices in research writing and provide a basis for advice for higher degree research education and associated supervisory pedagogies. The limitations of this research are examined for the purpose of providing recommendations for further studies in this area. Lastly, the researcher reflects upon his own intellectual growth through this memorable research journey.

1.5 Conclusion

This chapter has provided an overview of this study. It has stated the background of the research project reported in this thesis, research questions and their significance, and the theoretical and methodological rationales supporting this inquiry. By drawing

Foucauldian (1972) Discourse Analysis, this study examined East Asian PhD students' information practices in research writing through an analysis of their literature reviews. The thesis reconceptualised information practices in research education. The following chapter addresses the intellectual context in which this study is located and the research problem is generated.

Chapter 2

Information Practices in Higher Education

2.0 Introduction

The information practices of Asian doctoral students as evidenced in their research writing provide the focus for the research reported in this thesis. Since there is a large enrolment of international HDR students in Australia, research to explore the information practices of a small number of students in this cohort is especially important. Moreover, international HDR students are recognised as having the potential to contribute to “transnational knowledge exchange” and in so doing, advance Australia as a dynamic international knowledge society (LERU, 2010; Singh, 2010). However, their information practices, which are pertinent to their education and development as competent researchers and knowledge producers, have been under-researched. In particular, research linking the fields of Library and Information Science (LIS) and research education has been largely overlooked.

This chapter reviews the literature that informs the present study into discursive information practices evident in East Asian PhD students’ research writing, especially their literature reviews. The first section articulates the challenges and problems relevant to information practices as identified by past studies. Sections two and three review and carefully examine prevailing solutions offered by studies in LIS and research education. The fourth section explores the research relevant to information practices in the fields of research education and LIS.

2.1 Challenges and problems of information practices in academia

Information practices in research activities have become more significant today due to ongoing advances in information and communication technologies. Electronic journals

along with other digital academic resources are being widely used by research students at all levels (Nicholas et al., 2009). Voluminous information sources, however, are overwhelming for HDR (Higher Degree Research) students (and academics) trying to accomplish their research work (Switzer & Perdue, 2011). Challenges and problems have been identified in past studies, particularly in the area of LIS.

There are complications found in HDR students' information behaviours in their research. For example, Wang (2007) surveyed 315 pre-service teachers in a US university about their information behaviours. Key findings related to three aspects, namely information search, evaluation, and citation. First, in reporting on their capabilities of identifying keywords and narrowing down their searches, 40% of these students were struggling to identify the extent and scope of the information for accomplishing a task. Second, 80% of these students thought they were capable of critically evaluating information on the Web, but 32% were unfamiliar with standard evaluation guidelines. Third, 77% of these students regarded themselves as being able to cite web information, while only 35% of them were familiar with citation styles such as the APA (American Psychological Association) style. In terms of the challenges of information use, researchers and educators are not an exception. Rowlands and Nicholas (2006) conducted a survey of 5,513 senior journal authors about their behaviours, attitudes, and perceptions of a scholarly communication system. This research generated a wide range of findings on the scholars' use of information systems. For example, "most authors felt insecure in the face of the rapid growth of the literature" (Rowlands & Nicholas, 2006, p. 53) due to the information explosion. These studies (Rowlands & Nicholas, 2006; Wang, 2007) highlighted the complications that research educators and students face in their information behaviours.

Interview-based research has also identified similar problems in international students' information behaviours. For example, Chen and Ullen (2011), Mu (2007) and Hughes (2010) found that international undergraduate students have difficulties identifying

and using library resources for accomplishing their studies and also lack the knowledge to correctly cite information sources. Similar issues were also found among international research students. By investigating Chinese research students' (n=12) use of library services in a Canadian university, Liu and Winn (2009) found that these students could not take full advantage of library resources and were reluctant to seek assistance from university librarians to address their information needs. Problems with information practices also exist in research writing (Holbrook, 2007; Holbrook et al., 2008). A successful literature review for instance is essential to a research project because it must present a deep understanding of a particular intellectual area and also justify a research problem for developing original knowledge in that particular area (Tranfield, Denyer, & Smart, 2003). However, Boote and Beile (2005) found that many doctoral theses (n=30) did not demonstrate a mastery of the literature in a research field.

Challenges and problems reported in past studies cultivate the need for developing information practices within the field of HDR education (Fleming-May, 2009). Although previous studies in both LIS and research education provided various solutions, little research conducted the investigation of information practices in the context of research writing. Moreover, there is few effort cross-disciplinarily addressing such enquiry as information practices relevant to research writing. Many responses to the challenges and complications in research work were disparately addressed in the fields of LIS and research education (Aitchison, Kamler & Lee, 2010; Cotterall, 2011a; Kavuluru et al., 2012; McCulloch et al., 2010; Switzer & Lepkowski, 2007). The following two sections examine the major solutions in these two fields.

2.2 LIS strategies in information practices

In response to the challenges of information use among academics and students, there is a lack of all-round investigation in LIS about information practices. More effort has been paid on proposing various strategies in relation to information search-related

practices. Switzer and Lepkowski (2007) suggested that returning Master students have limited information literacy skills due to their extended absence from university life. Therefore, libraries need to develop more effective group and individual instruction for them to become acquainted with “the new search interfaces for ERIC, the library catalog and other databases; new mechanisms for document retrieval; and the elements of successful search strategy including keyword selection, truncation, Boolean operators and meaningful limits” (p. 1343).

Kavuluru et al. (2012) promoted an up-to-date knowledge-based literature search system for research work in the bioscience domains. This system attempts to “reduce the cognitive load on the users by presenting interesting and latest facts relevant to a specific domain of interest” (p. 283). With millions of information sources about bioscience, the system can computationally provide associative keywords and abstracts for researchers. In order to better measure the quality of a knowledge base, Kavuluru et al. (2012) also included “journal impact factors and confidence scores” (p. 283) into the algorithms of the system. They considered that this improvement could address the problem of accuracy when computational systems understand the meaning of natural language. Yet, concern can be raised for the applicability of this kind of system in the realm of humanities and social sciences. The semantic meanings in these disciplines can be more complex than the language in disciplines such as bioscience. There are often multiple meanings in a key word such as “discourse”, which gives rise to difficulty or even inaccuracy in locating the needed information. This complexity entails alternative conceptions towards the information practices in the social sciences. Riedler and Eryaman (2010) suggested “the postmodern conceptions of the nature of knowledge in the information age” (p. 90) to respond the complications in the information practices. Information is not a static object of which the use is simply a matter of technical and procedural evaluation of the efficacy of knowledge transmission (Riedler & Eryaman, 2010). Rather, it involves “use” or “abuse” in terms of interpretation or reproduction towards the democratisation of knowledge production and dissemination (Riedler & Eryaman, 2010). Therefore, current research about

information search or access is not sufficient to address the complications of research students. LIS research needs to embrace a holistic view towards information practices or at least put the same weight of investigation on the information use in research writing as on information search. The following section reviews research about the solutions to research students' information use in the field of research education.

2.3 Writing strategy as a major response in research education

LIS focuses on information search-related practices. In contrast, research education addresses the issue in research writing. Many studies have generated divergent yet similar frameworks for teaching students scholarly writing (Aitchison, Kamler & Lee, 2010; Cotterall, 2011a; McCulloch et al., 2010). However, there is few study addressing the information practices in research writing.

2.3.1 The “Community of Practice” view

The University of South Australia (UniSA) Education Team developed a rationale and framework for writing support (McCulloch et al., 2010). This framework draws upon three disciplinary traditions in research writing, namely applied linguistics, teaching English to speakers of other languages (TESOL), and rhetoric and composition studies. Four key pedagogical strands for developing research writing were identified:

1. Creating and sustaining a research-writing culture, which explores the nature of writing and research writing and the possibility of a writing culture, set within the context of the research degree and developing policy around HDR work;
2. Developing authority in writing, which explores what makes a “good” piece of research writing and what makes writing “authoritative” starting with pieces of writing the participants believe to be “authoritative”;

3. Providing feedback on writing, which focuses on the pedagogical function and significance of providing constructive feedback on research writing (including that of HDR students) and different strategies for doing so;
4. Writing for publication, which focuses on the publication process, the writing of abstracts and articles and explores strategies that facilitate a move beyond descriptive writing to engage a strong theoretical argument/position (p. 210)

This framework implies that HDR candidates can progress significantly into full membership of their academic community if adequate opportunities and resources are provided by supervisors and institutions at all levels. Such assumption can be seen as largely based on the concept of Community of Practice (CoP) (Lave & Wenger, 1991). CoP entails imparting understandings of disciplinary knowledge from expert community members to newcomers. However, the effectiveness of writing pedagogy can be compromised if it fails to adequately grasp the complex nature and relationships between supervisors and research students (Cotterall, 2011a). Cotterall (2011a) suggested that HDR students' learning processes can be constrained when expert CoP members either purposively make decisions to restrict opportunities, or lack the skills to make opportunities visible to research candidates. By drawing on the perspectives of international doctoral candidates about their writing practices, Cotterall (2011a) contended that the power relation between research students and supervisors is critical to the effectiveness of CoP. Power relations between HDR students and supervisors can affect the creation of certain learning opportunities and constrain the possibilities of others. The present study reported in this thesis is not to interrogate the power relations in terms of how the discursive practices construct the information practices in research writing. However, the consideration of power relations suggests that the present study would benefit from examining the issue of information practices at the level of discourse which is fundamental to understanding of doctoral students' information practices (See Chapter 3 and 4).

2.3.2 The “Genre” view

Starting from “genre”, Berkentotter and Huckin (1995) suggested supervisors to train students to work independently and familiarise themselves with the conventions of academic genre. This includes using writing pedagogies to unpack the rhetorical patterns and features of scholarly work as a means to support students. International research students with English as an additional language is the major group in need of such writing interventions. It is often assumed that research candidates coming from different cultural, linguistic and educational backgrounds may experience complications with rules, expectations and ways of doing things when they study in Australian higher education institutions (Kubota & Lehner, 2004; Paltridge & Starfield, 2007). The genre approach is recommended to supervisors and other learning advisors for them to assist second language students to understand the rhetorical patterns and features of scholarly work (Carter, 2011a; Hyland, 2007; Pho, 2008). This is based on research which suggested that this group is unfamiliar with western academic conventions (Abasi & Graves, 2008; Tardy, 2005) and supposedly holds a collectivist view of text ownership (Amsberry, 2010). Consequently the learning content in many writing pedagogies has largely focused on unpacking western academic conventions and their myths (Aitchison, Kamler & Lee, 2010; Cotterall, 2011a; McCulloch et al., 2010).

This pedagogical emphasis on genre can, however, be problematic. The genre approach diverts the attention of supervisors and academic learning advisors to the instruction of “form” – the devices of writing, while it neglects the instruction relating to the “content” of the scholarly works (Hillocks, 2005). Hillocks (2005) argued that knowledge of form cannot be directly translated into the skills or strategies necessary for dealing with the content and ideas that constitute a piece of writing. By comparing different methods of writing instruction, Hillocks (2005) suggested that the strategy most helpful to international HDR students’ writing is writing support that is based

within the context of their disciplinary content and ideas. This is preferably to focusing on strategies such as grammar instruction, the study of model pieces of writing, and free writing. The present study will draw upon this premise when investigating East Asian doctoral students' information practices evident in their research writing.

2.3.3 “Structure linking to content” perspective

With regard to content organisation in writing, Lee and Kamler (2008) identified strategies to develop HDR students' writing for publication. First, peer review is a pedagogical tool that makes comments on research students' work explicit and spotlights weaknesses for improvement in the next iteration of a text. Second, research evidence suggests that specific strategies such as graphic representations of part-whole relations between publishing texts and thesis are highly valued by student participants. Third, the pedagogy of textually mapping concepts between chapters helps research candidates elicit important resources for publishing from their theses. Lee and Kamler's (2008) principles on research writing concern how meanings and ideas from a thesis can be organised for publication. However, it was concerned with the organisation of information for publication from a complete thesis. It did not investigate how the information was written through the research writing process. The present study examined research students' information practices in terms of how literature is used and organised in their research writing. The following section reviews scholarly works which brought research education “writing” and LIS “information practices” together.

2.4 Bringing “writing” and “information practices” together

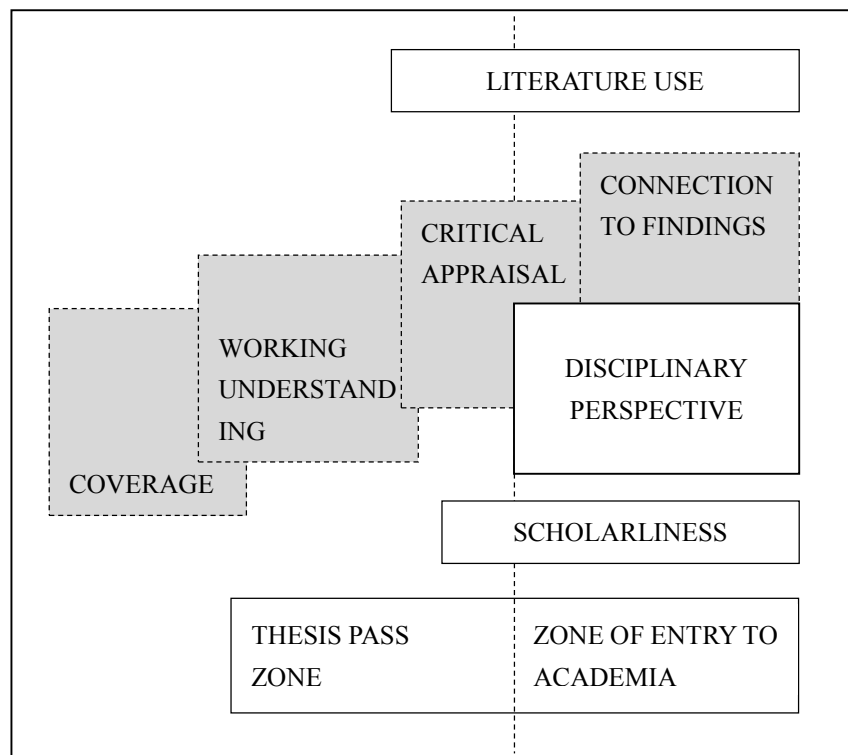
Drawing upon interdisciplinary studies in research education and LIS, this section reviews “embedded models” and “frameworks” which bring “literature review writing” (Boote & Beile, 2005; Bruce, 2001; Holbrook et al., 2007) and “information practices” (ACRL, 2000, 2014; Bundy, 2004) together.

2.4.1 Literature review studies in research education

This section concerns studies in research education which focus on writing a literature review. While there is little recent research directly addressing this topic, the following studies are of importance for the research reported in this thesis.

2.4.1.1 Literature use in a whole thesis

Holbrook et al. (2007) analysed thesis examiners' reports to identify examiners' attitudes about the use of literature in writing a thesis. This use of literature was examined from two main aspects: the coherent use of literature and the substantive use of literature in thesis writing. Their research produced five indicators of performance to evaluate the use of literature in a thesis (Figure 2.1).



Source: Holbrook et al. (2007)

Figure 2.1 Examiner expectation on literature coverage and use

The coherent use of literature concerns the first indicator “coverage of literature”, which includes the ability to select literature and accurately use references. Specifically, this means the “candidate’s ability or inability to select literature and position it in a way that advances an argument [and] the misuse or underuse of references in support of the argument (Holbrook et al., 2007, p. 345-6)”.

The substantive use of literature refers to the remaining four indicators: “working understanding”, “critical appraisal”, “connection to findings” and “disciplinary perspective”. “Working understanding”, refers to a solid knowledge and understanding of the literature. A poor understanding of the literature may lead to the misuse or underuse of references. In contrast, a good understanding assures quality coverage and use: “one step up from an acceptable level of literature ‘coverage’ is a solid knowledge and understanding of the literature—an understanding sufficient to allow for ordering and synthesis” (Holbrook et al., 2007, p. 347). In this sense, literature coverage – the selection and exclusion of literature – depends on HDR students’ understanding of the literature; and such understanding affects levels of synthesis, namely the organisation of literature in a thesis.

The third indicator of effectiveness in bringing academic writing and information practices together is “critical appraisal”, which refers to “the scholarly activity of weighing up the body of work” (Holbrook et al., 2007, p. 352). This is essential not only to coverage but also to the synthesis of the literature. For instance, critical apprehension of the various bodies of literature may foster a better discernment of the inclusion and exclusion of literature for review. The depth of understanding in literature resulting from critical appraisal signifies the HDR candidates’ expertness in their chosen field (Holbrook et al., 2007). Similarly, critical appraisal is indispensable to the synthesis of the literature in that it may lead to a genuine and unique perspective on a body of literature, suggesting scholarliness.

“Connection to findings” is the fourth indicator of literature use in a thesis (Holbrook et al., 2007). This is also one of important information practices in research writing. However, this indicator will not be examined in the present research since it focuses on literature review sections only. In the traditional sense of a thesis, the connection between the literature and the findings is found in the evidentiary chapters rather than in the literature review chapter (Bruce, 1994; Ely et al., 1997). Holbrook et al. (2007) interpreted the common conventions and expectations regarding the use of literature as “an early chapter devoted to a thorough review of relevant literature, and a final discussion in a chapter that revisits the literature” (p. 339). Thus, unfortunately the “connection to findings” indicator is not a concern in the analysis of information practices in the present research given that the data collected in this research are the literature review sections from PhD theses.

“Disciplinary perspective”, is regarded as the highest quality indicator for academic work, where research students “bring a perspective to the literature deeply grounded in their immersion in the discipline” (Holbrook, 2007, p. 1034). Disciplinary perspective “denotes a genuine grasp of theory and the candidate’s ever-present awareness of the literature and evidence of engagement with it, particularly in producing *a project that does make a significant and original contribution to the field*” (Holbrook et al., 2007, p. 349, emphasis added). This quality can be considered as a higher level of achievement in the information sense-making process. It indicates that research students can demonstrate robust understanding of the literature reviewed, sufficient to be able to build an argument through the critical evaluation of information.

Overall, Holbrook et al. (2007) demonstrated what performances are considered important to the proper use of literature in the eyes of examiners. The review of thesis examiners’ attitudes on literature reviews can be regarded as significant discursive practices (Foucault, 1972) that define in/appropriateness regarding ways of using literature in a thesis. Their study assisted the present research to better understand information practices in literature reviews. The discursive view (Foucault, 1972) to

this study will be unfolded in Chapter 4.

2.4.1.2 Literature coverage: From objective to subjective

In contrast with a holistic view of literature use in a thesis, Bruce's (2001) study focused on one aspect, namely the coverage of literature reviews. This study can be seen as a specific investigation on the coherent use of literature (Holbrook et al., 2007) by collecting beginning research students' views on literature coverage in writing a literature review.

Bruce (2001) found the variety of research students' notions regarding the coverage of literature ranged from "breadth", "relevance", "exclusion", "authority", "topicality", "comprehensiveness", "currency", and "availability". These notions were grouped into two approaches concerning the coverage of literature as a practice – the subjective and objective approaches to scope (Bruce, 2001). This classification of the coverage of literature depends on the status of the information as perceived by individuals. The subjective approach to scope regards information as "interpreted subjectively, from a user-perspective, psychological forms of relevance are preferred and relations are established between users and documents" (Bruce, 2001, p. 163). In contrast, the objective approach to scope concerns information being "interpreted objectively, topical forms of relevance are preferred; essentially relevance is considered an attribute of the document rather than a relation established by a user" (Bruce, 2001, p. 163). This suggests that different perceptions of information, either objectively or subjectively, can give rise to different descriptions of the scope of the literature.

The subjective approach to scope

In the subjective approach to scope, the relevance of a document is depicted not as a property of the document per se but a relation between the document and the information user (Bruce, 2001). Thus, information is not considered as static, it

involves a relation with the information user in a specific context of relevance. This perception towards information brings to the fore several inter-woven and overlapping notions – breadth, relevance, exclusion and authority. Breadth refers to the scope of literature sources “beyond [students’] specific topic or area of interest” (Bruce, 2001, p. 161). This means the literature that one includes in the review may not be “on the topic” of the research. It implied the present study to examine the ways in which doctoral students include a broader scope of information in literature reviews.

The second subjective notion of scope is relevance. Information perceived as relevant to the research may or may not derive from the topic of the research. In this sense, one may seek and include relevant studies not only in the specific field of research but also draw on analogies or implications for the topic of research from other areas of interest. With regard to the latter point of view, there may be some overlaps between relevance and breadth, as both these notions suggest the inclusion of literature beyond the specific topic of interest. This can be seen in phrases such as “broader book review of topic” (Bruce, 2001, p. 161) in reference to breadth, and “relevant material” (Bruce, 2001, p. 161) alluding to relevance. Hence, literature sources are not necessarily limited to the research topic, HDR students may include literature from other areas as long as relevance can be drawn in certain ways. The different ways deciding relevance with regard to a research topic are, perhaps, the key difference between breadth and relevance. For breadth, the literature included offers a general background to a research (Bruce, 2001), while the notion of relevance means the literature is more specifically focused. The example given by Bruce (2001) for the notion of relevance is that the inclusion of literature for peer tutoring may also include literature for mentoring. Despite this effort to distinguish these two notions, the differences between them remains vague due to lack of precise definition given in Bruce’s (2001) study. In the present study relevance was treated as a general notion which may embrace all the forms of literature coverage. Breadth was referred to coverage beyond the particular research topic.

Exclusion is the third notion under the umbrella of the subjective approach to scope. Exclusion is “the need to exclude a particular range of information” (Bruce, 2001, p. 162). This notion is the opposite of relevance. When HDR students determine the relevance of a range of information with their research, they may undergo a process of excluding, either consciously or unconsciously, other sources of information for review. The process of excluding certain information sources, however, can be made by HDR students’ supervisors who are familiar with the range of information in the research field (Bruce, 2001). Thus, they can preclude their HDR students from reviewing pre-identified and irrelevant literature. This could be an issue in the analysis of HDR students’ literature reviews because the researcher cannot claim that PhD students themselves exclude a particular group of literature at their own discretion. However, this analysis did not examine who conducted this exclusion, but attempted to look at how exclusion was practised in the writings of literature reviews.

The last key notion in the subjective approach is authority. This refers to literature that is fundamental in the research area. Phrases representing this notion include “core texts” and “the basics of a subject” (Bruce, 2001, p. 162). Locating and including the fundamental information for a review is a subjective process. This is because this process embraces a critical evaluation of the significance of literature in its contribution to the field. This notion also averts HDR students from indiscriminately including “relevant” literature which leads to an excessively large scope. This sheds light on the analysis of PhD students’ literature reviews that, if there are any, the researcher may look at the diverse ways of how fundamental works are identified and addressed in literature review. The notions of breadth, relevance, exclusion and authority are the key elements in the subjective approach to scope. However, they do not account for all ways relating to the coverage of literature. Notions concerning of the objective approach to scope have yet to be examined.

The objective approach to scope

The objective approach to scope regards the relevance of a document as the property of the document itself, such that “there is a particular set of information that must be identified by a user interested in a particular area” (Bruce, 2001, p. 163). There are four notions to describe this approach – topicality, comprehensiveness, currency and availability.

The first is topicality. This notion concerns the inclusion of literature in the topic area of the research. Opposite to the notion of breadth, topicality does not include a review of information beyond the topic of interest. The coverage of the information is specifically limited to the research topic. This is the most elementary view with regard to the scope of literature (Bruce, 2001). HDR students may simply seek and recruit information in a specific topic area of research. This also denotes that HDR students do not need to concern about information that provides a general background or supporting topics in other areas. However, it may not be possible that a literature review merely includes the information limited to the topic area for the establishment of an argument. Thus, the analysis of PhD students’ literature reviews can investigate the extent to which an argument or problem is developed through the discussion of literature in the topic area of research.

The second notion – comprehensiveness – demands the full retrieval of the literature in the research area. Hence, the scope of information is the holistic area of interest relevant to the research. There are two connotations of this notion. Comprehensiveness can either refer to the inclusion of information about all possible aspects of research interest or only one focussed research area. However, no matter what orientation this notion takes, comprehensiveness is one type of objective approach to scope that emphasises exhaustiveness in the inclusion of information for review. These practices of comprehensiveness imply an analysis of literature reviews to explore the extent of and how HDR students retain the full inclusion of information sources. However, as

HDR students cannot lay claim to the “authenticity” of comprehensiveness, the analysis needs to pay attention to the subject’s tendency or thinking about the retrieval of full information as literally performed in literature reviews.

Currency is the third notion in the objective approach to scope. It is an interest in timely information, that is, the scope of information is determined by timeliness. Despite the uncertainty of how the limits of currency are determined, phrases such as “up-to-date”, “current research”, and “current knowledge” indicate that there is a close bond in the sense of time between the present research and past studies which should be recognised. The analysis of literature reviews can investigate the extent to which HDR students include information with regard to currency.

The last notion, availability, received less attention from Bruce (2001). It simply means that the inclusion of information depends on accessibility of physically and locally available material. It may seem obvious that information included in literature reviews is all the available information HDR students may access. However, there can be variations of this notion. For example, information along with its reference may be transcribed from other available information, while the original piece of information is not retrieved. In this sense, availability is still a significant element to the scope of literature and is subject to examination. The present study, therefore, analysed evidence of the information coverage in literature reviews as relevant to this particular information practice.

Bruce (2001) discussed various notions relevant to the coverage of literature, and also argued the appropriateness of the subjective approach to literature review. To write a sound literature review, research students need to embrace more of the subjective approach to scope rather than the objective approach. Bruce suggests that:

Where ways of thinking associated with the objective approach are deemed important, then any decisions should remain subservient to

decisions made associated with the subjective approach. For example, a work that sheds light on the research problem should not be considered of less significance because it does not meet the criteria of currency. (p. 163)

The present study did not set out to determine which approach is more appropriate and important to the scope of the literature. Rather, these accounts as well as the examiners' perspectives to the use of literature (Holbrook, et al., 2007) were all considered as the discursive practices that are proper to HDR students' writing of a literature review.

2.4.1.3 A holistic approach to literature review

The last study reviewed about literature review instructions in research education is that of Boote and Beile (2005). Their work characterised a rubric of literature review (See appendix IV) aiming to provide clear standards for HDR students. The creation of a literature review is described as consisting of categories such as "coverage", "synthesis", "methodology", "significance", and "rhetoric". Each category also embraces groups of specific criteria.

"Coverage"

The first category in the rubric is "coverage". This is basically the same idea as the first indicator reported by Holbrook et al. (2007). Boote and Beile (2005) defined coverage as "justified criteria for inclusion and exclusion from review" (p. 8). HDR students may or may not articulate in writing the rationalisation for the literature chosen for review. However, Cooper (1985) argued that "how reviewers search the literature and how they make decisions about the suitability and quality of materials involve methods and analytic processes that are unique to this form of scholarship" (cited in Boote & Beile, 2005, p. 7). This suggests the abilities relevant to the coverage of literature may demonstrate levels of acceptance of scholarship.

“Synthesis”

“Synthesis” includes six criteria that specifically define the practices relevant to synthesis of the literature:

1. Distinguish what has been done in the field from what needs to be done
2. Place the topic or problem in the broader scholarly literature
3. Place the research in the historical context of the field
4. Acquire and enhance the subject vocabulary
5. Articulate important variables and phenomena relevant to the topic
6. Synthesise and gain a new perspective on the literature

(Boote & Beile, 2005, p. 8)

These criteria may be looked upon as three groupings. The first three criteria can be perceived as not only related to synthesis of the literature, but also informing the coverage of literature. Criteria four and five concern the entities (subject vocabulary and variables and phenomena) that literature synthesis focuses on. The sixth criterion is concerned with the act and consequence of synthesis. These groups are reviewed and described below.

The first criterion refers to the extent of the synthesis by characterising the literature which can be included for synthesis. This closely relates to the former category of coverage. Synthesis provides a specific form of literature coverage, suggesting that the scope of the literature is the aggregation of all studies in the chosen field of research, and limited to that particular field. Specifically, the criterion of synthesis requires HDR students to pay attention to the field level of coverage and synthesis. A HDR students first collect information on “what has been done” in the field and then distinguish “what needs to be done” out of the aggregation of past studies in this field. A field of research consists of various research topics/problems, then the question “what needs

to be done” can be seen as the topic of interest distinguished from the various topics within this field. Thus, collecting literature within a field and refining the research topic from the literature are key practices in this first criterion. Echoing the notions “breadth” and “topicality” (Bruce, 2001), when the literature decided upon is on the research topic of the particular study, it suggests the coverage of topicality, and when the literature reviewed is about other supporting topics within the research field, it enacts the coverage of the breadth of literature. Breadth is not exclusively limited to this field level of literature coverage and synthesis however; it may also overlap with the second criterion referring to the inclusion of information in “the broader scholarly literature”.

The second criterion concerns the literature for coverage being from the broader scholarly literature, and synthesised for positioning the topic in question. This gives rise to a greater degree of freedom in the coverage of literature, that is, literature may either be included in the field of research or beyond the particular field. Within the second criterion, the coverage and synthesis of literature may or may not be based on the field where the research is located. Rather, they are based on the topic level where there is a consideration of the research topic and similar ones in all possible areas of knowledge. Through this topic level of coverage and synthesis, relevant literature may be found, amalgamated, and used to position a study. The topic level of literature coverage and synthesis also intersects with the key notions of “breadth” and “topicality” (Bruce, 2001). When literature on the research topic is found within the particular field of study, it conforms with topicality in the sense that it is to be “a body of written material relating to a specific topic or area of concern” (Bruce, 2001, p. 161); when the literature to be reviewed is beyond the field of research, it may be considered as breadth since it concerns of the research topic in wider areas.

The third criterion for literature synthesis places “the research in the historical context of the field”. The synthesis of literature is based on an aggregation of historical information on the topic of research in that particular field. This historic level of

literature coverage and synthesis is different from the former two levels. The first level of synthesis concerns the collection of information in a particular field. Various interrelated topics in the field of research might be reviewed, to enable HDR students to position their own research topic or problem in this research field. The second level of coverage and synthesis focuses on information limited to the particular research topic or problem. However, the scope of the literature can go beyond a particular research field by extending to other fields of knowledge relevant to the topic of research. The third level is a review of the history of a topic in the field being researched. Specifically, the review of historical information is not of all the topics in the research field nor is it on the particular topic in all potentially relevant fields. Rather, it is a review of the history on this particular topic being located in this particular field of research. Figure 2.2 below is an illustration of the different levels of literature coverage and synthesis.

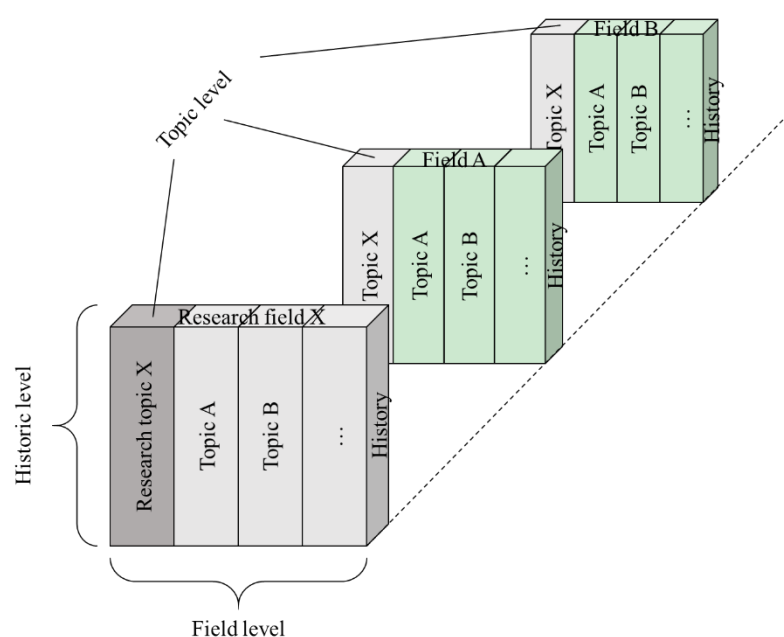


Figure 2.2 The levels of literature coverage and synthesis

The levels of coverage and synthesis that have been discussed so far are all about the positioning of the research from different angles. The research topic or problem, then, may be positioned by HDR students' review of literature in the field of research (field

level), in potentially related fields (topic level), and/or the history of research topic in the research field (historic level).

Criteria four and five, which relate to general levels of literature synthesis, indicate entities for which the literature is synthesised. Criterion four “[a]cquire and enhance the subject vocabulary” is concerned with synthesis of the literature in regard to the vocabulary that HDR students intend to use. Research usually involves key terms to be defined but different sources of information may or may not interpret the same term in the same way. This requires HDR students to include this kind of information when synthesising the literature. Furthermore, depending on the degree of synthesis, the rubric can also include some sub-criteria: “key vocabulary not discussed”, “key vocabulary defined”, and “discussed and resolved ambiguities in definitions” (Boote & Beile, 2005, p. 8). These can be used to evaluate the extent to which HDR students discuss the vocabulary via the synthesis of literature in their research.

Criterion five is likewise concerned with another consideration involved in literature synthesis – “variables and phenomena”. This refers to the literature synthesised to articulate “important variables and phenomena relevant to the topic”. These variables and phenomena may be perceived as important findings about the topic of the research. Therefore, the synthesis of the literature is an inclusion and discussion of the relationships of these key findings in past studies. Like the articulation of the subject vocabulary, there is also a degree of variation in the articulation of variables and phenomena. HDR students may look upon the synthesis of literature in this part as ranging from “key variables and phenomena not discussed” to “noted ambiguities in literature and proposed new relationships” (Boote & Beile, 2005, p. 8).

The last criterion is about generating a new perspective through the synthesis of the literature. Although generating a new perspective is not an essential quality in literature review, there is a high expectation of this quality among thesis examiners (Holbrook et al., 2007; Holbrook, 2007). As mentioned above, a demonstration of embeddedness

in disciplinary perspective is an important indicator of HDR students' entry in scholarship. In the present study, the various articulations of information practices helped in conceptualising a new map that can be used to analyse the PhD students' information practices in literature reviews.

“Methodology”

“Methodology” is the third category articulated by Boote and Beile (2005) in their effort to provide clear standards for literature reviews. It consists of two criteria:

- (1) Identify the main methodologies and research techniques that have been used in the field, and their advantages and disadvantages
- (2) Relate ideas and theories in the field to research methodologies

The first criterion articulates the inclusion of information on research methodologies and techniques applied in past studies. The second criterion concerns the theoretical underpinnings that may be relevant to research methodologies in the field. These articulations require HDR students to become familiar with and synthesise information regarding methodologies in their particular field of research. Boote and Beile (2005) indicated that the state of a field may often be limited by the research methods being applied in that field, or observably, the development of a field is closely related to the increased sophistication of its research methods. Thus, HDR students may first of all evaluate the research methods as synthesised from past studies. Then one should evaluate the theoretical assumptions underpinning the application of these methods. Lastly, if possible, HDR students may consider new research methods for addressing the current research topic and contribute to the field.

“Significance”

“Significance”, the fourth category, also consists of two criteria:

- (1) Rationalise the practical significance of the research problem
- (2) Rationalise the scholarly significance of the research problem

These criteria indicate that HDR students need to consider both the practical and scholarly significance of the research in their writing of a literature review. Similar to finding a new perspective through synthesis, the derivation of research significance is also a result of synthesising past studies on the topic of research. Rationalising the significance of research, both practical and scholarly, depends on HDR students’ understanding of prior research in terms of the identification of implications, ambiguities and limitations. Boote and Beile (2005) said “[a] dissertation should discuss both the scholarly and the practical implications of the existing research on a topic and, preferably, note any ambiguities or shortcomings in the literature” (p. 9). This ever-present awareness of the inconsistencies and limitations of prior studies gives rise to the articulation of significance in the undertaken research.

“Rhetoric”

Referring to rhetoric, Boote and Beile (2005) stated that literature reviews are to be “written with a coherent, clear structure that supported the review” (p. 8). Rhetoric requires HDR students to write a literature review with a comprehensible and unambiguous structure. This involves the cogent articulations of claims with purposeful organised writing. Rhetoric, however, is not a concern in the present study. Since the study focuses on information practices in literature reviews, it draws on articulations of the coherent use of literature rather than the coherence in the structure of writing. Nonetheless, this category can be worth investigating in subsequent research where the information use and writing devices are studied in terms of their

relationships and joint constructions to the thesis writing.

In summary, Boote and Beile's (2005) study offered a fuller picture of literature reviews than the former two studies (Bruce, 2001; Holbrook et al., 2007). This holistic approach suggested that the synthesis of literature involves the articulation of relations between the research field, the topic and the research itself. Based on this articulation, subject vocabularies are included, variables and phenomena are discussed, and new perspectives are expected to emerge. Additionally, discussions on research methodologies and the significance of the research are also bases of the synthesis.

In part, the above approaches can provide analytical tools to investigate the information practices in literature review writing. Yet, there is little research examining the approaches themselves as discursive practices that support the enunciation of a literature review (Foucault, 1972). The examination of these approaches at the discursive level, thus, gives rise to a more holistic view in research education towards the writing of a literature review. The investigation of information practices in literature reviews also entails relevant research in Library and Information Science. The following section provides a review of key frameworks in LIS which can also be seen as discursive practices contributing to the categorisation and data analysis from the LIS perspective in this research.

2.4.2 Information Literacy Frameworks and scholarship in LIS

In the field of LIS, there have been frameworks developed for the scholarly use of information in research. Three influential frameworks are "Information Literacy Competency Standards for Higher Education" adopted by the US Association of College and Research Libraries (ACRL, 2000; see Appendix II). A modified version of the US framework in Australia entitled "Australian and New Zealand Information Literacy Framework" (Bundy, 2004; see Appendix III). "The Draft Framework for Information Literacy for Higher Education" (ACRL, 2014; see Appendix I) is a revised

version of the 2000 Information Literacy (IL) framework. This section reviews these frameworks, because they represent the discourse (Foucault, 1972) in LIS which is pertinent to our understanding of information practices in research writing.

The provenance of these frameworks can be traced to endeavours in developing what is called “information literacy”, considered a core component and contributor to lifelong learning (ACRL, 2000). Information literacy was first defined by Zurkowski (1974) as “information technology, information access and solution-oriented problem solving work” (p. 6). Over the past few decades this notion has evolved and extended to include the effective and ethical use of information for the purpose of knowledge exchange and production (Catts & Lau, 2008). A frequently cited definition of IL comes from the American Library Association (ALA): “To be information literate, a person must be able to recognise when information is needed and have the ability to locate, evaluate, and use effectively the needed information” (Johnston & Webber, 2003, p. 337).

This highly condensed definition describes the general characteristics of information literate HDR students in any disciplinary field. It distinguishes information behaviour from basic information skills such as information search and access (Johnston & Webber, 2003). This definition gives rise to various frameworks attempting to prescribe the desired and valued information behaviour including all the HDR students. To become information literate individuals, HDR students need to demonstrate the holistic competencies in terms of information search, analysis, evaluation, synthesis, and critical reproduction and interpretation of information. The section below reviews the specific content of these frameworks. They were devised initially to help individuals such as HDR students to develop their lifelong learning abilities, but can also be contemplated in the context of information practices in literature reviews.

The frameworks – all-around aspects of information practices

The ACRL Framework (ACRL, 2000) and the Australian IL Framework (Bundy, 2004) have articulated all-around aspects of information practice in terms of information need, information search, information management, information use, information communication, and information ethics. The US information literacy framework rests upon five standards:

- (1) Standard One: Determines the nature and extent of the information needed
- (2) Standard Two: Accesses needed information effectively and efficiently
- (3) Standard Three: Evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system
- (4) Standard Four: Uses information effectively to accomplish a specific purpose
- (5) Standard Five: Understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally

(ACRL, 2000)

Each standard includes a group of “performance indicators” labelled by numbers, while each single indicator prescribes a set of outcomes as ordered by alphabetic letters. Likewise, the Australian IL framework consists of six standards which are exhibited below:

- (1) Standard One: Recognises the need for information and determines the nature and extent of the information needed
- (2) Standard Two: Finds needed information effectively and efficiently
- (3) Standard Three: Critically evaluates information and the information

seeking process

- (4) Standard Four: Manages information collected or generated
- (5) Standard Five: Applies prior and new information to construct new concepts or create new understandings
- (6) Standard Six: Uses information with understanding and acknowledges cultural, ethical, economic, legal, and social issues surrounding the use of information

(Bundy, 2004)

The Australian IL framework differs from the US version, in that it directly states a group of “learning outcomes” for each standard and each outcome is exemplified by specific rules of performance. Although the two frameworks are organised differently, their contents are largely the same. Thus, they can be reviewed together.

The US IL framework along with its variant versions has been major guidelines for information literacy in the last decade. However, there are dynamic changes in the higher education environment calling for updates in the ways of doing things. ACRL (2014) noticed these changes and thus conducted a revision of information literacy, stating “the rapidly changing higher education environment, along with the dynamic and often uncertain information ecosystem in which all of us work and live, require new attention to foundational ideas about that ecosystem” (p. 1). Hence, a group of best minds in the library profession as well as some experts in higher education joined the revision task force. In 2014, based on the 2000 version of ACRL Framework, “The Draft Framework for Information Literacy for Higher Education” was published (ACRL, 2014). In this revised framework, information literacy is not divided into sets of activities as described in the former version. Rather it is now seen to consist of six core frames considered as fundamental to information literacy. These include “Scholarship is a Conversation”, “Research as Inquiry”, “Authority is Constructed and Contextual”, “Format as a Process”, “Searching as Exploration”, and “Information has Value”.

The above overview of the three frameworks suggests that there are different ways of conceptualising information practices. The first two frameworks emphasise specific information practices involved in a task, while the revised framework provides key concepts that inform specific information practices. The following sections review key features and concepts of information practices that apply to the present study.

2.4.2.1 The essence of information practices

As was done in the selective approach to reviewing the articulations in research education, this thesis also excluded some accounts of information practices in LIS which were less relevant to the present study. In particular, this study looked at the articulations of “information need” and “information use”, while the enunciations on information search, management, communication, and ethics were excluded from this review. Both sets of information practices can be found in the ACRL and Australian IL frameworks. The review of these two parts from the two frameworks are detailed below.

Information need

“Information need” is articulated in Standard One of the US and Australian information literacy frameworks. Several elements characterise the nature and extent of information need. First, the extent of information need may be determined by the identification of key concepts or terms. This is indicated in the outcome “1.1.e identifies key concepts and terms that describe the information need” (ACRL, 2000, p. 8).

“Research topic” and “key concepts and terms” are closely related to information need. They can enable HDR students to make decisions by defining the specific area of needed information. Thus, they are performing as a threshold beyond which

information need may be fostered. Both the US and Australian IL frameworks have included this point in their articulations about the extent of information need.

The other element relevant to the extent of information need is “availability”, which was found in the US framework. Information need is delimited by consideration of the costs and benefits of retrieving information. According to Standard 1.3 of the US IL framework, the costs and benefits of acquiring potential information need to be appraised. These include concerns of whether the information seeking process should be broadened beyond local resources, the need for acquisition of a new language or skill for accessing more information, and the feasibility of an overall plan for information retrieval. This delimitation of information need was eliminated from the Australian framework, and replaced with “diverse sources of information” (Standard 1.4) that may inform information decisions.

These articulations in Standard One also characterise the nature of information need, which may be interpreted two ways. The first interpretation is determined by the nature of the information source. Information sources refer to the production of information. These include various types and formats for organising and disseminating information. The variations in information organisation and dissemination may lend different meanings to the nature of information need. For example, there are primary and secondary sources for information, while their use and importance vary by disciplines. Relevant articulations can be found in the US IL framework:

1.2.b Recognises that knowledge can be organised into disciplines that influence the way information is accessed;

1.2.e Differentiates between primary and secondary sources, recognising how their use and importance vary with each discipline. (ACRL, 2000, p. 8)

These articulations suggest that HDR students need to identify the differences of information, in terms of the use and importance of different levels of sources in the

disciplines studied. They imply that the nature of information need is to consider information sources in the disciplinary context in the way information is organised.

The nature of information need is also determined by the ways of disseminating information, which considers the formats and audiences of information and how these considerations may achieve certain purposes. There are a variety of formats through which information might be disseminated. However, each format of information is laden with values for serving particular audience and achieving particular purposes. Thus, recognising these differences may foster better discernment when comparing and locating appropriate sources for information need:

- 1.2.c Identifies the value and differences of potential resources in a variety of formats (e.g., multimedia, database, website, data set, audio/visual, book);
- 1.2.d Identifies the purpose and audience of potential resources (e.g., popular vs. scholarly, current vs. historical). (ACRL, 2000, p. 8)

Besides the production and formats of existing information, the possibility to produce new information out of extant information may also imply the information needed. This is shown in the following accounts:

- 1.1.f Recognises that existing information can be combined with original thought, experimentation, and/or analysis to produce new information;
- 1.2.f Realises that information may need to be constructed with raw data from primary sources.

(ACRL, 2000, p. 8)

In a sense, new information may be produced through analysis, experimentation, or original thought on existing information, while this newly obtained information satisfies or informs further information need. The above articulations have described how the nature of information defines information need. The nature of information

need is not only characterised by the nature of information, it is also characterised by “information need” itself.

From both the frameworks, HDR students can understand that information need itself is procedural, as it involves re-evaluation on the nature and extent of the information need. The US IL framework has provided some guidelines to account for the formulation of information need. The framework:

- 1.1.b Develops a thesis statement and formulates questions based on the information need;
- 1.1.c Explores general information sources to increase familiarity with the topic;
- 1.1.d Defines or modifies the information need to achieve a manageable focus;
- 1.4.a Reviews the initial information need to clarify, revise, or refine the question;
- 1.4.b Describes criteria used to make information decisions and choices.

(ACRL, 2000, pp. 8-9)

The guidelines shown above have depicted how information need may be enunciated. They also characterise the procedural nature of information need itself. Nonetheless, the guidelines need to be distinguished from those on information search process. As this research did not study the techniques of using information search tools or systems, these guidelines cannot be considered as specific information search strategies. Rather, they may be seen as an orientation that enables HDR students to map the general steps for addressing information need.

The review and interpretation of Standard One in the US and Australian IL frameworks have identified important elements of the perception of information need. Some guidelines in the two frameworks are relevant to the extent of the information need.

Information need is fostered by the identification of research topics or key concepts, and is delimited by the available resources one may access. Moreover, there are other guidelines dealing with the nature of information need. In a sense, information need is defined by the nature of information which includes the production, dissemination, and creation of information. It is also characterised by the procedural nature of information need itself. The next section considers the articulations on information use in the IL frameworks.

Information use

To be able to appropriately use information in a literature review, HDR students first need to understand information properly. Hence, the first thing to consider regarding information use is “information understanding”. Articulations on information understanding were found specifically in the US IL framework. Compared with the explicitness in the US IL framework, the Australian IL framework treated the elements on information understanding as presumed and thus, largely avoided specific articulations on them. However, for developing a complete description of information use, information understanding in terms of accurate apprehension and interpretation on information cannot be ignored. According to Standards 3.1 and 3.6 of the US IL framework, information understanding comprises the elicitation of main ideas from the information gathered either by quoting verbatim material or restating main concepts in their own words. Moreover, for developing proper interpretation of information, HDR students may also validate the understanding of information by participating in discussions with peers and/or experts. Hence, this group of information practices as stated in the US framework can be seen as relevant to information understanding.

The second group of information practices characterises the evaluation of information. This includes the evaluation of information sources and the information itself. Both dimensions can be evaluated in terms of reliability, validity, accuracy, authority,

timeliness, and point of view or bias. The evaluation of information also involves evaluation of the structure and logic within the information; potential prejudice, deception, or manipulation; and the cultural, physical or other contexts that may have an impact on the creation and interpretation of information. In addition to the evaluation of any bias and context in the information itself, the Australian IL framework further considers the bias and cultural context of the information user. It “recognises and understands own biases and cultural context” (Bundy, 2004, p. 17). With this additional consideration, HDR students can develop a more complete picture of information evaluation. Information evaluation can be seen as similar to one of the indicators put forward by Holbrook et al. (2007) – “critical appraisal”. However, there is little articulation on the specific performance of critical appraisal. Hence, these practices on information evaluation from the LIS field may provide concrete ideas of how information and its sources can be critically evaluated.

“Information synthesis” is the third group of information practices. HDR students may be informed of different levels of information synthesis by reading the articulations in the US IL framework. The first level of information synthesis takes place between the elements of information obtained. Information is synthesised at this level by articulating interrelationships between the constituents, combining them into a coherent whole, and interpreting the collective of information at a higher level of abstraction. At this level of information synthesis, HDR students may derive new information or hypotheses grounded on the grouped information collected, while this newly obtained information requires yet more information to compare with, viz., it “extends initial synthesis, when possible, at a higher level of abstraction to construct new hypotheses that may require additional information” (ACRL, 2000, p. 11). This comparison between new information and prior information then, is the second level of information synthesis. It requires one to discern the value added, contradictions, or other unique characteristics in the newly obtained information against prior information (Performance indicator four, Standard Three). Moreover, according to the specific outcomes of indicator four, the validity and accuracy of new information need

to be warranted through tests, questioning data sources or the limitations of the search methods. It means that HDR students:

3.4.d Tests theories with discipline-appropriate techniques (e.g., simulators, experiments);

3.4.e Determines probable accuracy by questioning the source of the data, the limitations of the information gathering tools or strategies, and the reasonableness of the conclusions.

(ACRL, 2000, p. 12)

Compared with the first level of synthesis that is concerned with relations between the information collected, the second level of information synthesis deals with the newly obtained information around which various practice are formulated. Lastly, there is a third level of information synthesis in which the newly obtained information is, in various ways, integrated into HDR students' research. This is implied by the articulations from indicator five, Standard Three, where one:

3.5.a Investigates differing viewpoints encountered in the literature;

3.5.b Determines whether to incorporate or reject viewpoints encountered.

(ACRL, 2000, p. 12)

The fifth indicator suggests that these are the general practices when “the information literate student determines whether the new knowledge has an impact on the individual’s value system and takes steps to reconcile differences” (ACRL, 2000, p. 12). In this sense, the integration of new information into HDR students’ research may rightly be perceived as the integration of new knowledge into one’s value system. As a result, the parallel analogy drawn between them generates this third level of information synthesis. From the “language” of academic communication, this level of information synthesis concerns how new ideas or perspectives as derived from the literature review may support the argument of the research (Holbrook, 2007).

Like the various practices relevant to the information need, the articulations above interpret the various practices of information use. In a sense, information use can be comprised of several aspects including information understanding, evaluation, and synthesis. According to the IL frameworks, there are specific information practices being attached to each aspect of information use. These frameworks, however, were critiqued for the production of dogmas, which is a reductionist approach to the study of the complex, socially constructed information practice (Andersen, 2006; Elmborg, 2006). Nonetheless, for the present study the IL frameworks provide a repertoire of information practices against which their specific performance in doctoral literature reviews can be studied. Moreover, these frameworks are not only old archives silently stored in libraries, but also subject to update against dynamic changes in the higher education environment. An awareness of these changes resulted in a revision of information literacy which was embodied in ACRL (2014). The draft framework published in 2014 is the result of the effort. The following section is to review this document in details.

2.4.2.2 The key concepts in information practices

The revised IL framework consists of six threshold concepts of information practice. The concepts entitled “Scholarship is a Conversation”, “Research as Inquiry”, and “Authority is Constructed and Contextual”, which are closely related to the present study, are reviewed below.

Scholarship is a Conversation

This concept refers to “the idea of sustained discourse within a community of scholars or thinkers, with new insights and discoveries occurring over time as a result of competing perspectives and interpretations” (ACRL, 2014, p. 5). This concept concerns the nature of scholarship. Scholarship is basically understood as a

conversation rather than the authority of knowledge. An understanding of a problem is not given once and for all. Rather, there are competing perspectives on an issue being formulated, debated, and weighted over one another through a long period of time (ACRL, 2014). This understanding of scholarship, then, has significant implications for HDR students' information practices. In a sense, literature included for review is not to give a single and authoritative answer to the problem concerned. Rather, HDR students bring a scholastic conversation on the problem in question by engaging with and negotiating meanings, ideas, perspectives, and/or interpretations encountered in academic discourse.

Research as Inquiry

The second of these threshold concepts is “research as inquiry”. This refers to “an understanding that research is iterative and depends upon asking increasingly complex questions whose answers develop new questions or lines of inquiry in any field” (ACRL, 2014, p. 6). In regard to this concept, ACRL (2014) says: “experts recognise the collaborative effort within a discipline to extend the knowledge in that field by developing a knowledge base of lines of inquiry, research methodologies, and best practices for conducting research” (p. 6). This concept considers research as a means to address an inquiry. Inquiry refers to the question or problem being examined, while the derivation of this inquiry is based on lines of inquiries previously concerned in a discipline or between disciplines (ACRL, 2014). Hence, for HDR students to address an inquiry, one has to engage with a knowledge base where there is information of various inquiries, research methodologies, and best practices relevant to the inquiry concerned. This grouped information might be different from the information to which the preceding concept refers. It seems that information under “scholarship is a conversation” is more about the “result” of a problem, while the information concerned in the second concept is more about the problem itself. Thus, information is divided into two groups. The first information group consists of ideas, interpretations, perspectives upon the problems researched. The second group, in contrast, embraces

information such as how a research question or problem is derived from lines of inquiry, and how it is addressed in past studies in terms of appropriate research practices and research methods having been employed.

In actuality, information in literature reviews cannot be clearly categorised as above. It is integral, and both concepts may participate in the enunciation of it. For example, reviewing information on research methods is relevant to the development of a research inquiry (Research as Inquiry), and it also necessarily engages in a conversation with various perspectives and ideas on the research methods used in past studies (Scholarship is a Conversation). Though a particular text involves several concepts operating in it, the analysis may focus on one major concept according to the degree of its significance and relativity over other concepts. This way of attributing evidentiary texts to particular concepts provides a clear view towards the research students' literature reviews and facilitates the coding procedure. However, this relativity of categorisation has been borne in mind throughout the analysis.

Constructed and Contextual Authority

The last concept involved in the present investigation is “authority is constructed and contextual”. This concept particularly deals with an information source in terms of the authority being attached to it. Authority, according to ACRL (2014), mainly depends on three things: the resources' origins, the information need, and the context of using this information. Authority is contextual as the degree of it is partly determined by information need (ACRL, 2014). Different purposes breed different information needs, while a particular information need may credit certain information sources over others. In the context of scholastic writing, HDR students may consider information from academic journal articles, books, or conference papers as authoritative as they may fulfil the information need for developing rigorous arguments accepted in academic communities. Hence, authority is also constructed in a way that different communities value particular information sources over others (ACRL, 2014). With regard to

authority in academic communication, HDR students may value certain publications or publishers over others in a particular discipline. However, the articulation also cautions that “[a]llowing that some kinds of expertise are more worthy than others can result in privileging certain sources of information unduly” (ACRL, 2014, p. 7). Since the authority of information is both contextual and constructed, it is not a status or attribute that will never change. These characters of authority require information users to embrace “an attitude of informed scepticism and an openness to new perspectives, additional voices, and changes in schools of thought” (ACRL, 2014, p. 7).

This Section 2.4.2 has reviewed information practices in the field of LIS. Specifically, there are accounts of information need and use in both the ACRL and Australian IL frameworks. There are also some core concepts articulated in the revised ACRL IL framework. All of them may constitute another group of analytic tools that, in conferring with the tools derived from research education, can be used in the analysis of doctoral students’ literature review sections.

2.5 Conclusion of the chapter

Information practices in literature reviews remain a myth in research education. This study focused this issue on a group of East Asian doctoral students’ research writing practices. This group is considered as a potential contribution to “transnational knowledge exchange” and advancing Australia as a dynamic international knowledge society (LERU, 2010; Singh, 2010). However, the information practices of this cohort are often under-researched and/or overlooked in both fields of library & information science and research education. Past studies in the two areas have largely contributed to developing research students’ information search abilities and writing abilities with various strategies (Carter, 2011a; Cotterall, 2011a; Kavuluru et al., 2012; Lee & Kamler, 2008; McCulloch et al., 2010; Olsson, 2010; Switzer & Lepkowski, 2007). Nevertheless, relatively little attention has been paid on the discourses of the two areas *per se* that are investing in the information practices of literature reviews and are

constantly invoked by these practices (Foucault, 1972). This chapter has therefore reviewed major articulations in both of the fields that can be relevant to information practices in literature reviews (ACRL, 2000, 2014; Boote & Beile, 2005; Bruce, 2001; Bundy, 2004; Holbrook et al., 2007). These accounts in research education and LIS are used in the data analysis in this study.

However, the discourses in both areas need to be contemplated through a theoretical lens. The Foucauldian (1972) discourse is this theoretical lens used in the present study to identify and accord relevant discourses to the study of information practices, and to reconceptualise the discourses that can be discerned more clearly and applied in data analysis. Hence, Chapter 3 reviews Foucault's (1972) theories on discourse. With this theoretical tool, this thesis set out to reconceptualise the discourses in HE and LIS, and to develop a working framework accounting for information practices with a greater degree of systematism. This working framework is demonstrated in Chapter 4. It serves as a guide for analysing doctoral students' literature reviews, as demonstrated in the evidentiary chapters (Chapter 5, 6 and 7).

Chapter 3

A Foucauldian Discursive Approach to Investigating Information Practices in Research Writing

3.0 Introduction

This chapter reviews the key concepts of Michel Foucault, the French philosopher and social theorist, which can be used to reproduce a framework of information practices in research writing. Foucault's work offers "a kind of tool-box" (Foucault, 1974, p. 523) with which to approach the study and analysis of research students' writing. His work has been characterised as being like Swiss cheese where "readers found themselves in the holes and it was up to them to find their way out, choosing their own direction" (Willcocks & Mingers, 2004, p. 239). The "way out" in this study was to acquire knowledge of related research on research education and LIS as done in Chapter 2 and to contextualise that knowledge through Foucault's (1971, 1972, 1980, 1986, 1994) discourse to develop a theoretical-pedagogical framework of information practices. The tool box developed in this chapter was used to analyse the features of research writing by East Asian PhD students in Australia.

3.1 Where Foucauldian Discourse Analysis fits

Foucauldian Discourse Analysis is located in the complex landscape of contemporary social theories. Reckwitz (2002) provided four orientations to explain how social theorists explain and understand the social construction of reality, namely culturalist mentalism, textualism, intersubjectivism, and practice theory. These all place social theory in the cognitive and symbolic structures of knowledge, while the analytic unit of social reality varies between them (Reckwitz, 2002). For culturalist mentalism, the "smallest unit" of social analysis is mental structures, since the human mind has been

believed to be “the place of knowledge and meaning structures” (Reckwitz, 2002, p. 247). This epistemology stands in opposition to culturalist textualism which localises the social not in the mind but outside of it through “chains of signs, symbols, discourse, communication or texts” (Reckwitz, 2002, p. 248). It seems that culturalist mentalism and textualism are separate modes of conceptualising the social. The rise of textualism has undergone a process of transformation in which textualism detaches itself from culturalist mentalism.

Thoughts from well-known psychoanalysts such as Sigmund Freud and Jacques Lacan may partially shed some light on this transformation. Day and Lau (2010) considered Freud’s work on the unconscious and its expressions as products of experiences that one encounters. This subverts the traditional divide between the internal mind and the external world as found in orthodox cognitive research. This is the case in some information behaviour research such as the Belkin’s (1990) ASK² model, in which a mental process for information incorporation is prescribed. This model emphasises the internal mechanism of the mind but overlooks the social constructionist nature of the mind itself (Day & Lau, 2010). For Freud, human needs such as the need for information are not generated solely from the reasoning mind but are functions of desires and drives being developed through one’s worldly experiences. Although Freud indicated the significance of external situations, his work remained focused on the human mind by describing it as quasi-anatomical psychological faculties (Day & Lau, 2010).

Lacan put the unconscious as part of a topographical structure within a subject’s mind and stated “the unconscious is the discourse of the Other” (Lacan & Mehlman, 1972, p. 45). Lacan regarded the “Other” as “the symbolic order” that, in terms of social

² “The theory of Anomalous States of Knowledge follow two metaphors: first, that information is transmitted from a ‘generator’ to a receiver (qua person) and, second, that information is some sort of quasi-empirical entity (traditionally called *qualia* in the philosophy of mind—short for qualitative feelings) that fills in knowledge gaps in a user’s mental ‘state’” (cited in Day & Lau, 2010, p. 102).

relations and cultural forms (with language in particular), construes the subject's being. Therefore, in Lacanian psychoanalysis individual needs are recognised as desires whose drives "are formed and fulfilled by the subject's position in the symbolic" (Day & Lau, 2010, p. 107). Compared with Freud, Lacan's theory indicated a stronger linguistic turn, as he located the symbolic structure not in the inwardness of mental qualities but on the level of signs and texts (Reckwitz, 2002).

In the last third of the twentieth century, this transformation in psychoanalysis partially gave rise to a collection of thoughts that may be grouped as culturalist textualism (Reckwitz, 2002). Foucault's work is one of the main branches that can be attributed to textualism. Hence, for research where Foucault (1971, 1972, 1980, 1986, 1994) will be applied and tested, it is necessary to have an overview on his work. The following section reviews the essentials of Foucault's (1972) discourse and then explains the analytic direction chosen to drive the present study.

3.2 The "discourse" concept

Foucault (1972) did not provide a specific definition of discourse. This gives rise to a space where researchers use this concept with a certain degree of freedom. As a result, there are different interpretations on Foucauldian discourse. For example, Dreyfus and Rabinow (1983) refer to discourses as serious speech acts that are:

[...] divorced from the local situation of assertion and from the shared everyday background so as to constitute a relatively autonomous realm, [...] Such speech acts gain their autonomy by passing some sort of institutional test, such as the rules of dialectical argument, institutional interrogation, or empirical confirmation. [...] This systematic, institutionalized justification of the claim of certain speech acts to be true of reality takes place in a context in which truth and falsity have serious social consequences. [...] Any speech act can be serious if one sets up the necessary validation

procedures, community of experts, and so on (p. 48)

This interpretation of discourse focuses on the institutional level. Discourse is seen as a product manufactured through the process of institutionalised justification. According to this definition, Frohmann (1994) suggested that Foucauldian discourses are distinct from everyday conversations, being performed by institutionally privileged speakers. He demonstrated how Melvil Dewey's technobureaucratic discourse impacted upon the transformation of librarianship. Technobureaucratic discourse, as maintained by institutions, promotes professional management through the use of so-called "efficient", standardised, mechanised and bureaucratic techniques. It is this validly institutionalised talk with these technologies of power that constructs a form of subjection of a librarian's work identity and practices:

The discursive construction of librarianship as the institution, operation, and maintenance of rationalized, mechanized, standardized, and technobureaucratic procedures constructs an identity for the librarian – professional colleague of the corporate executive – which contests his traditional role as guardian of high culture (Frohmann, 1994, p. 130).

The interpretations of Dreyfus and Rabinow (1983) and Frohmann (1994) were further elaborated by another LIS researcher, Talja (1999). Differing from their perspectives that may seem to overemphasise the institutional power of discourse, Talja (1999) took individuals as a starting point to study discursive practices. He embraced a variety of texts as discursive practices that can affect and are at disposal of an individual subject (or worker):

In order to study serious speech acts and institutionalized talk, the speakers of the study need not be institutionally-privileged speakers. For instance, information-seeking narratives, reading narratives, information society narratives, Internet narratives, and library narratives can be studied from a

variety of texts. The combination of interviews and written texts, or texts representing different contexts of discussion, enhances the generalizability of research results (p. 15).

Thus, discourse is not exclusively performed by institutionally privileged speakers; it is also an interpretative practice performed by any work regardless of their roles and positions. This argument extends the study of discourse beyond “formal” institutionalised talk.

3.3 The Horizontal aspect of Foucauldian discourse

Foucauldian discourse is horizontally interwoven with concepts of knowledge and power which are significant to post-structuralist interpretations of truth and reality (Foucault, 1980; Kendall & Wickham, 1999; Martin, 1988; Olsson, 2010; Simons & Masschelein, 2010). Knowledge is construed by discourse being imbued with power. Foucauldian discourse contends knowledge or truth as mediated by “the ensemble of rules according to which the true and the false are separated and specific effects of power attached to the true” (Foucault, 1980, p. 132). From a historic analysis of the discursive construction of the human sciences, Foucault argued that the intersubjective nature of knowledge and truth mean that it is “neither based on a perceived correspondence with an ‘objective’ reality, as in the positivist or Aristotelean tradition that has dominated Western thinking since the Enlightenment, nor is it wholly subjective, as in existentialist philosophy” (Olsson, 2010, p. 66). Rather, knowledge and truth are symbolic products made by rules with “shared meanings, conventions, and social practices operating within and between discourses” (Olsson, 2010, p. 66). The discursive rules form a system of dispersion within which objects, modalities of enunciation, concepts, and thematic choices are selected, defined, and produced as knowledge or truth (Foucault, 1972). Knowledge or truth is operationalised by discursive rules in terms of:

- (1) The limits and forms of expressibility;
- (2) The limits and forms of conservation;
- (3) The limits and forms of memory;
- (4) The limits and forms of reactivation (Foucault, 1978, pp. 14-15)

Through the rules of formation, discourse evaluates, validates, and defines knowledge or truth and the conditions of its existence. This configuration enables members of a discursive community to share a body of statements as true or otherwise as false or inferior (Olsson, 2010).

The discursive rules cannot be used arbitrarily to manage the production of knowledge. They are maintained by technologies of power. Technologies are constituted by specific techniques that individuals use to understand “the real” and themselves within the symbolic order (Martin, 1988). There are four major types of overlapping technologies within which knowledge is “played” as “truth games”:

- (1) technologies of production, which permit us to produce, transform, or manipulate things;
- (2) technologies of sign systems, which permit us to use signs, meanings, symbols, or signification;
- (3) technologies of power [domination], which determine the conduct of individuals and submit them to certain ends or domination, an objectivizing of the subject;
- (4) technologies of the self, which permit individuals to effect by their own means or with the help of others a certain number of operations on their own bodies and souls, thoughts, conduct, and way of being, so as to transform themselves in order to attain a certain state of happiness, purity, wisdom, perfection, or immortality (Martin, 1988, p. 18).

The technologies of production and sign systems are used in the study of the sciences and linguistics (Martin, 1988). Foucault's (Martin, 1988) work focused on the last two technologies – the technologies of domination and self. These technologies are based on his studies on power. The meaning of power, from his perspective, is not referring to dominant objects such as institutions and mechanisms with their assertions of particular rules:

The analysis, made in terms of power, must not assume that the sovereignty of the state, the form of the law, or the over-all unity of a domination are given at the outset; rather, these are only the terminal forms power takes (Foucault, 1978, p. 92).

Foucault (1978) considered power as permanent, repetitious, inert, and self-reproducing, coming from everywhere while subjecting individuals to a complex strategic situation. Thus, power is understood:

...[I]n the first instance as the multiplicity of force relations immanent in the sphere in which they operate and which constitute their own organization; as the process which, through ceaseless struggles and confrontations, transforms, strengthens, or reverses them; as the support which these force relations find in one another, thus forming a chain or a system, or on the contrary, the disjunctions and contradictions which isolate them from one another; and lastly, as the strategies in which they take effect, whose general design or institutional crystallization is embodied in the state apparatus, in the formulation of the law, in the various social hegemonies (Foucault, 1978, pp. 92-93).

There are nuanced differences in these interpretations of power. The first perspective of power applies an analytic focus on individual entities in terms of their social class or occupational status. For example, Hussey (2010) defines power in terms of the

concepts of capital drawn mainly from economic and cultural resources. Referring to “symbolic violence”, Bourdieu (Hussey, 2010) suggested that members of the dominant class accrue the most economic and cultural capital and they apply power to justify their status and to legitimate their social practices. Moreover, as they have the confidence and knowledge based on their status, they even express their lack of knowledge without expressing the ignorance by which they can be judged. Conversely, all linguistic practices have to be “measured” depending on their legitimate practices due to their domination of language.

Instead of holding power as the “property” of the actors themselves, Miller (2008) suggested that poststructuralist accounts largely regard power as “relation” in the discursive order. That means individuals are empowered by discursive practices rather than by their social status. Miller (2008) explained this with the example of doctor’s power in a clinical setting:

The doctor’s power over the patient [...] is here conceptualised not as an effect of occupational status per se but instead as tied to the ways doctors can mobilise the privileged discourse of professional medicine in order to enforce their version of the patient’s “problem” in the clinical setting (p. 269).

Power is not an individual attribute being unique and beyond repeatability, but it is a repeatable materiality that can be discursively fashioned by anyone who may occupy particular subject positions – albeit not equally (Foucault, 1972). Hence, power is strongly tied to discursive practices. The production of knowledge is indispensable to the power relations invested in discursive practices.

Studies adopting Foucault’s theory of power relations examine how the power present in discursive practices constructs particular objects or subjects. For example, Graham

(2007) examined power relations in the school system through which the disorderedness of a child is construed not only as a medical, psychological or social object, but also as an object which may serve certain political ends. José and Coronel (2006) examined university students' accounts of educational practices to show how disciplinary technologies have a major impact on the construction of particular types of students. Of immediate relevance to this study, Frohmann (1994) examined how LIS theories construct the identities of information searchers.

The present study, however, was not a genealogical inquiry (Graham, 2007; Willig & Stainton-Rogers, 2008) which looks at the immanent power relations involved in the information practices in research writing. It is possible to study various objects appearing in literature reviews, for instance, as being discursively constructed in research writing through history. Also it is possible to examine the status of research writers according to what particular subjects are being transformed in relation to texts, disciplines, supervisors, and societies through research writing. Unfortunately, such studies could not be undertaken in this research due to the limitations of time and available resources. Moreover, studying discursive practices in terms of the power relations in the construction of particular information practices in research writing requires the identification of a system of discourses relevant to these combined practices. Nonetheless, such a system of discourse has yet to be investigated fully. This entails investigations of the discourse itself prior to further inquiries such as power relations operating in the very fabric of research writing.

This study aimed to explore the scope of discourses, with limitation, as relevant to the information practices in research writing. It involved the exploration of those combined discourses in two areas of higher education – the field of research education, where there is discussion on research writing regarding literature reviews (Boote & Beile, 2005; Bruce, 2001; Holbrook et al., 2007), and the field of LIS, where there is

knowledge on information practices (ACRL, 2000, 2014; Bundy, 2004). These two areas were considered as most relevant to information practices for research writing. Thus, the research reported in this thesis has explored the discourses in the making of particular objects of information, the designation of particular subjects on specific information practices, and the concepts invested in these practices. It was assumed that only when research students are substantially informed of the objects of information, subject positions, and existing concepts in the discourses, can research students make deeper inquiries on research writing by themselves.

In sum, the foregoing overview of Foucault's (1972) work has provided direction for the research reported in the present study. This study into information practices in research writing tested Foucault's (1972) theories of discourse. His work offers "a kind of tool-box" (Foucault, 1974, p. 523) to approach the phenomenon under study. The key tool used extensively in this study was discourse and its constituent element, the "statement". The sections below specifically look at the term "discourse" to examine its core aspects, and then the concept of "statement" (Foucault, 1972).

3.4 Vertical aspect of the discourse Foucauldian "statement"

It is variously understood that Foucault's (1974) ideas are a box of tools that one may use in various ways for specific purposes. Discourse may be defined in terms of whether it is institutionally generated and/or gathered from daily-life conversations. Foucault's (1974) definition of discourse is closely related to the important concept of "statement". Foucault (1972, p. 90) states that discourse is seen "sometimes as the general domain of all statements, sometimes as an individualisable group of statements, and sometimes as a regulated practice that accounts for a certain number of statements". In this sense, statements are the core unit of discourse. Thus, understanding Foucault's idea of discourse largely resides in the understanding of the concept of statement. The section below explicates the concept of "statement" in detail.

3.4.1 Statement – a function of existence

In an immediate sense, any group of signs such as a word, sentence, document or even a whole book can be considered as a statement (Radford & Radford, 2005). However, this does not imply that a statement is equivalent to sentence, proposition, or a formulation such as a speech act (Foucault, 1972). These are the units of analysis that researchers are familiar with. However, a statement cannot be perceived the same as a sentence, proposition, or formulation. Foucault (1972) contends that a statement can never accommodate the grammatical model of a sentence, nor the logical model of a proposition, nor the psychological formulation of a speech act. These models consist of “too numerous and too heavy” [criteria, while] “the statements [are] more tenuous, less charged with determinations, less strongly structured, more omnipresent, too, than all these figures” (Foucault, 1972, p. 94). Moreover, the statement establishes a unique relationship between language and material objects:

The statement exists neither in the same way as a language (although it is made up of signs that are definable in their individuality only within a natural or artificial linguistic system), nor in the same way as the object presented to perception (although it is always endowed with a certain materiality, and can always be situated in accordance with spatio-temporal coordinates) (p. 97).

For Foucault, a “statement” is neither entirely linguistic nor exclusively material. Although a “statement” involves a certain materiality, it is beyond the dimensions of a material existence. Although a statement is manifested to a certain extent in language, “the language exists only as a system for constructing *possible* statements; it exists only as a (more or less exhaustive) description obtained from a collection of real statements” (Foucault, 1972, p. 96). A statement belongs to a different level than that of language and material objects. This unique position requires a perception of a

statement as a structure in which there is “a group of relations between variable elements, authorising a possibly infinite number of concrete models” (Foucault, 1972, p. 97). A statement is a function of existence of a group of signs. In other words, a statement enables groups of signs to exist by figuring their formulation at the enunciative level. This configuration of enunciative relation is not like signification, as in the relation of the sentence to its meaning or the relation of the proposition to its referent. Foucault (1972, p. 100) suggested that “the relation of the statement to what it states is not superposable on any of these relations”. Instead, it is anterior to the signification of the type: “we must know to what the statement refers, what is its space of correlations, if we are to say whether a proposition has or has not a referent” (Foucault, 1972, p.101). A statement does this in a special way as the bearer of enunciative functions that define the modality of existence proper to a group of signs (Foucault, 1972). This modality, as Foucault (1972) suggested, allows a group of signs:

to be something more than a series of traces, something more than a succession of marks on a substance, something more than a mere object made by a human being; a modality that allows it to be in relation with a domain of objects, to prescribe a definite position to any possible subject, to be situated among other verbal performances, and to be endowed with a repeatable materiality (p. 120).

If individuals can accord a particular meaning to a group of signs rather than treat them merely as a series of marks, it is because the group of signs are the statement that a set of conditions invoked (Roan, 2013). The conditions may prescribe a domain of objects, a position of the enunciative subject, other verbal performances, and a repeatable materiality. For a group of signs referring to a particular meaning, all of the conditions have to be operating in them. Hence, the following sections look at the conditions essential to the existence of a statement.

3.4.1.1 Statement – the rule of a referential

The function of a statement may operate when it designates a space of correlations. Foucault (1972) calls this space of correlations “referential”, that is, “made up not of ‘things’, ‘facts’, ‘realities’, or ‘beings’, but of laws of possibility, rules of existence for the objects that are named, designated, or described within it, and for the relations that are affirmed or denied in it” (p. 103). The reference of a statement characterises verbal performances, that is, at the enunciative level of formulation, any group of signs may be placed in various domains of possibility in which rules of existence are prescribed. For example, if a research student says a sentence that is meaningless, it is because the student is in a domain that denies the validity and acceptability of the enunciation. To describe an idea as coloured or colourless may not be acceptable in a domain of material objects, while it could be possible if a research student endows the enunciation with the domain of fictitious objects where arbitrary rather than physical properties are at play (Foucault, 1972). In this sense, the reference of the statement “forms the place, the condition, the field of emergence, the authority to differentiate between individuals or objects, states of things and relations that are brought into play by the statement itself; it defines the possibilities of appearance and delimitation of that which gives meaning to the sentence, a value as truth to the proposition” (Foucault, 1972, p. 103). Thus, this relationship needs to be distinguished from the relations between the signifier and signified, the proposition and its referent, the sentence and its meaning. A statement is related to a domain of enunciation in which the familiar relations described above may be identified (Gupta, 1999).

3.4.1.2 Statement – the rule of a subject

To describe the existence of a statement, a subject must be assigned. The subject of a statement is “a particular, vacant place that may in fact be filled by different individuals; instead of being defined once and for all, and maintaining itself as such throughout a text, a book, or an oeuvre” (Foucault, 1972, p. 107). This place “varies – or rather it

is variable enough to be able either to persevere, unchanging, through several sentences, or to alter with each one” (Foucault, 1972, p. 107). The subject of a statement is a vacant place that may be occupied by any individual; and it may also be subject to change rather than occupied by one and the same individual (Gupta, 1999). These characteristics distinguish the subject of a statement from the laws of language (Hitchcock, 1993). Three reasons were given by Foucault (1972, pp. 103-104) to describe the differences:

First, because the subject of the sentence is not within the linguistic syntagma; secondly because a statement that does not involve a first person nevertheless has a subject; lastly and above all, all statements that have a fixed grammatical form (whether in the first or second person) do not have the same type of relation with the subject of the statement.

Moreover, the subject of a statement cannot not be considered as the author of the formulation. This dissociation denies one as:

[T]he cause, origin, or starting-point of the phenomenon of the written or spoken articulation of a sentence; [as] meaningful intention which, silently anticipating words, orders them like the visible body of its intuition; [as] the constant, motionless, unchanging focus of a series of operations that are manifested, in turn, on the surface of discourse through the statements. (Foucault, 1972, p. 107)

As such, it seems that Foucault never marks the subject as agent, but the subject as a position which is produced through discursive practices (Hitchcock, 1993). The subject of a statement is anterior to this author and enables the author to occupy a particular position in the enunciative events. This implies the need for the analysis of a verbal performance rather than “the relations between the author and what he says (or wanted to say, or said without wanting to); but in determining what position can

and must be occupied by any individual if he is to be the subject of it” (Foucault, 1972, p. 107).

3.4.1.3 Statement – the rule of an associated field

For a statement to exist, it has to be immersed in an enunciative field. This enunciative field is a domain of coexistence in which a statement always situates itself with other statements in a way either to presuppose or to support each other:

There is no statement in general, no free, neutral, independent statement; but a statement always belongs to a series or a whole, always plays a role among other statements, deriving support from them and distinguishing itself from them: it is always part of a network of statements, in which it has a role, however minimal it may be, to play. [...] There is no statement that does not presuppose others; there is no statement that is not surrounded by a field of coexistences, effects of series and succession, a distribution of functions and roles. (Foucault, 1972, pp. 111-112)

A statement, relative to other statements, always occupies a place in an enunciative field and performs as an element in the operation of the enunciative function. This operation makes possible the formulations of various enunciations (Foucault, 1972). For instance, an enunciative field – such as information practices or research writing – constituted by a group of statements characterises variously autonomous and describable relations. These relations include, for example, the grammatical relations between sentences, logical relations between propositions and rhetorical relations between groups of sentences. It is the deployment of this enunciative field that enables sentences “to follow one another, order one another, coexist with one another, and play roles in relation to one another” (Foucault, 1972, p. 112). An enunciative domain, wherein a group of statements coexist and invoke, is not a “context”, but makes context possible and recognisable (Harris, 1988). This enunciative domain specifies a variety

of principles in which a group of statements may be organised and actualises the formulations of specific content in various contexts of use (Lamke, 1995). This enunciative domain forms a complex web which is

[...] made up first of all by the series of other formulations within which the statement appears and forms one element. [...] It] is also made up of all the formulations to which the statement refers (implicitly or not), either by repeating them, modifying them, or adapting them, or by opposing them, or by commenting on them; there can be no statement that in one way or another does not reactualize others. [...] It] is also made up of all the formulations whose subsequent possibility is determined by the statement, and which may follow the statement as its consequence, its natural successor, or its conversational retort. Lastly, [it] is made up of all the formulations whose status the statement in question shares, among which it takes its place without regard to linear order, with which it will fade away, or with which, on the contrary, it will be valued, preserved, sacralized, and offered, as a possible object, to a future discourse. (Foucault, 1972, pp. 110-111)

This web shows how various formulations may multiply in the enunciative field (Foucault, 1972), and also helps in tracing back and locating the discursive web of statements which are crystallised in the sequence of linguistic elements. A statement plays a role in various realms of formulations. A statement can be an element in the formulations; it can involve the formulations to which it refers; it can be the possible consequences to which the formulations give rise; or it can share the status with the formulations.

3.4.1.4 Statement – the rule of materiality

A statement is characterised by its material status. The material status is constitutive of the statement itself, providing the statement with a substance, a support, a place,

and a date (Foucault, 1972). However, materiality does not refer to those spatio-temporal attributes such as those that form of colour, sound, solidity or the date of formulation. Two identical texts with the same writing, the same characters, and the same semantic and grammatical forms sometimes cannot be regarded as one and the same statement. On the other hand, two texts with different enunciations, either in different semantic and grammatical structures or being enounced through different mediums, can produce an equivalent statement (Foucault, 1972). All these cases suggest materiality, an important attribute of a statement, is not a perceptual matter or a space that comprises the statement's existence. It is considered as a function of institutionalised routines of repetition embedded in a statement and characterises the relations between them (Frohmann, 2004). According to Foucault's (1972) account, "the rule of materiality that statements necessarily obey is [...] of the order of the institution rather than of the spatio-temporal localisation; it defines possibilities of reinscription and transcription (but also thresholds and limits), rather than limited and perishable individualities" (p. 116). Hence, the identity of a statement is recognised through the institutional order to which it is attached. The discursive practice of the statement depends on this materiality that defines the forms of its repeatability, thresholds and limits of its circulation.

This identity of a statement is further elaborated in Foucault's (1972) accounts of a second group of conditions and limits. These are the fields of stabilisation and use. In general, this group of conditions and limits can be considered as the reification of repeatable materiality attached to a statement. The field of stabilisation characterises the relations that a statement has with other statements. These relations stabilise the use of the statement in a particular enunciative field. Moreover, stabilisation defines the threshold for a statement: "[A threshold] beyond which there can be no further equivalence, and the appearance of a new statement must be recognised" (Foucault, 1972, p. 116). A paper about documentation in LIS can be seen as a statement if its relations are established with other relevant studies to formulate a field of stabilisation. This field of stabilisation acknowledges the knowledge produced by that paper and

defines the scope of its application (Radford & Radford, 2005).

The field of use is another dimension concerned with the repeatable materiality of a statement. The identity of a statement depends on the role and functions that it can perform: “[T]he constancy of the statement, the preservation of its identity through the unique events of the enunciations, its duplications through the identity of the forms, constitute the function of the field of use in which it is placed” (Foucault, 1972, p. 117). However, the field of use of a statement is susceptible to variation due to the status of materiality. The materiality of a statement is “a status that is never definitive, but modifiable, relative, and always susceptible of being questioned” (Foucault, 1972, p.115). Further, Foucault (1972) argues that:

This repeatable materiality that characterizes the enunciative function reveals the statement as a specific and paradoxical object, but also as one of those objects that men produce, manipulate, use, transform, exchange, combine, decompose and recombine, and possibly destroy. Instead of being something said once and for all – and lost in the past like the result of a battle, a geological catastrophe, or the death of a king – the statement, as it emerges in its materiality, appears with a status, enters various networks and various fields of use, is subjected to transferences or modifications, is integrated into operations and strategies in which its identity is maintained or effaced. Thus the statement circulates, is used, disappears, allows or prevents the realization of a desire, serves or resists various interests, participates in challenge and struggle, and becomes a theme of appropriation or rivalry. (p.118)

A statement “becomes an item in circulation that impacts the statements it comes into contact with” (Radford & Radford, 2005, p. 71). Taking the example of the documentation research again, this study may undergo transferences or modifications in various fields or networks of use. It may be used, cited or critiqued in other studies

of documentation, or it may enter a different field of knowledge either by a certain degree of analogy or implication. In each case, the identity of the study is maintained or effaced in a particular field of enunciation. Hence, a statement may appear not only in one domain of discursive formation, but also potentially appear in other realms generating the networks with other statements in that particular place (Radford & Radford, 2005).

In sum, the rules of the existence of the statement have been explored above. According to Foucault (1972), the existence of a statement requires:

a referential (which is not exactly a fact, a state of things, or even an object, but a principle of differentiation); a subject (not the speaking consciousness, not the author of the formulation, but a position that may be filled in certain conditions by various individuals); an associated field (which is not the real context of the formulation, the situation in which it was articulated, but a domain of coexistence for other statements); [and] a materiality (which is not only the substance or support of the articulation, but a status, rules of transcription, possibilities of use and re-use) (p. 129).

These rules not only characterise the being of a statement but also give rise to its enunciative function which has a bearing on groups of signs. They govern the discursive formations in which particular objects are named, modalities of enunciation are stabilised, concepts in a domain are used, and a system of strategic choices are identified. The following section reviews the four Foucauldian directions of discursive formations – objects, enunciative modalities, concepts, and strategic choices.

3.4.2 The four directions of discursive formations

The four systems of discursive formations, namely objects, enunciative modalities, concepts, and strategic choices, are the four directions of enunciative function in which

statements may operate:

[O]ne can define the general set of rules that govern their objects, the form of dispersion that regularly divides up what they say, the system of their referentials; [...] that govern the different modes of enunciation, the possible distribution of the subjective positions, and the system that defines and prescribes them; [...] that [are] common to all their associated domains, the forms of succession, of simultaneity, of the repetition of which they are capable, and the system that links all these fields of coexistence together; lastly, [...] that govern the status of these statements, the way in which they are institutionalized, received, used, re-used, combined together, the mode according to which they become objects of appropriation, instruments for desire or interest, elements for a strategy (Foucault, 1972, p. 129).

Each direction of enunciation is comprised of specific rules of discursive formation. Foucault (1972, p. 81) contends that there is “a vertical system of dependencies” between them. For example, the modalities of enunciation are described according to the subjects’ enunciative positions in relation to the particular objects of which one is speaking. The groups of concepts are associated with particular modes of enunciation and groups of objects. Thus, strategic choice is a system in which there is a selection of groups of concepts, enunciations, and objects that are integrated into a coherent body. In addition to these four interrelated systems, this research uses the first three discursive formations. This is because Foucault (1972) has described how objects, enunciations and concepts come into being through discursive rules while leaving behind the work of a fuller analysis of strategic choices. The discursive formation of strategies involves a synthesis of the former three systems into a discursive domain. The individualisation of a strategic choice comes from different strategies in various domains of discourse. Hence, this analytic work demands more than has been possible for the present study reported in this thesis. The study of discursive rules of a strategic choice requires further study. Thus, with regard to the present study, the discursive

analysis provides a necessary but obviously limited focus for investigating information practices in research writing.

Although Foucault (1972) did not fully describe the discursive formations of strategic choices, details for studying the discursive formations of objects, enunciative modalities, and concepts are suggested. This study identifies the existence of certain objects, enunciations, and concepts in the current discourse of information practices related to research writing. The present study does not examine how objects, enunciative modes, and concepts relevant to information practices for research writing are brought into being through the discursive formations. Thus, the exploration of discursive formations of the three directions noted above are used in the analysis in the present study. Foucault's (1972) work provides various analytic tools. His account of discursive formations is used to identify these elements being "active" in the discourses relevant to information practices in research writing. They are not used to examine how objects, enunciations, or concepts are formulated. Hence, the following sections focus on a discussion of these discursive formations through reference to the order of objects, enunciative modes, and concepts.

3.4.2.1 Statement to form objects

The first system of the statement is the discursive formation of objects. The discursive rules for the formation of objects are attached neither to things nor words (Foucault, 1972). Rather, a series of objects of knowledge in certain discourse is stabilised in a group of discursive relations. Specifically, the formation of objects is dependent on the surfaces of their emergence, the authorities of delimitation, and the grids of specification (Foucault, 1972). The surfaces of emergence refer to the possible domains where certain things may be located. These domains often consist of certain conceptual codes or types of theories about the ways objects may be identified, differentiated and analysed. The authorities of delimitation refer to institutions or individuals with the power for creating discourses through the delimitation of certain

objects. Lastly, the grids of specification are systems for dividing, classifying or regrouping objects in a particular discourse or discourses.

Thus, a particular object cannot be determined by any one of the above systems. This can be exemplified by the case of psychiatric diagnosis (Powers, 2001). The surfaces of emergence consist of certain domains along with their particular rules. Thus, a discourse of the medicine of psychiatry emerges from the surfaces of natural science and philosophy and follows the rules prescribed by these domains (Powers, 2001). Meanwhile, the relations as established between the medicine of psychiatry and its domains (surfaces of emergence) are possible because of the authorities of delimitation invested in them. These authorities for the delimitation of the appearance of psychiatric medicine include courts, religious authorities, employers, families, and school officials (Powers, 2001). Moreover, these authorities of delimitation also coordinate in the production of “grids of specification” in the discourse of psychiatric medicine. The Diagnostic and Statistical Manual of Mental Disorders (4th edition) is one of the taxonomies that classifies different types of physical and behavioural states for psychiatric diagnosis (Powers, 2001). Hence, the three dimensions are closely related in a discursive web, and because of this discursive web that things can be named, designated, and analysed (Foucault, 1972). With regard to the present study, the information practices in research writing also emerge in the authorities of various domains of delimitation (see Chapters 2 and 4). The “surfaces” most concerned within the academic context are the areas of research education and LIS. These fields of knowledge define the specific elements (grids of specification) that can be found in the information practices of research writing.

3.4.2.2 Statement to form enunciative modalities

Modes of enunciation are determined by discursive relations between three dimensions – the status of a subject, institutional sites, and the positions of a subject in relation to domains or objects. Enunciative modalities are recognised “neither by recourse to a

transcendental subject nor by recourse to a psychological subjectivity” (Foucault, 1972, p. 61). In other words, the regularities of enunciating things are not defined by either of these routes. The status of a subject is a consideration given to research students’ “inside” qualities, such as the competence or knowledge one retains. Institutional sites refer to domains that legitimise research students’ application of certain enunciations. Lastly, research students may occupy various positions of enunciation in relation to the domains one is placed in or the objects research students are speaking about. These dimensions, as are those ones concerning the formation of objects, operate congruently with the formation of enunciative modes. In the context of the research education domain, the status of the subject can be retained by obtaining relevant knowledge on information practices and research writing. The institution of higher education not only provides the space for applying the knowledge but also legitimises its application in this particular space. Specifically, in relation to various objects involved in research writing such as producing a literature review, research students may occupy several enunciative positions such as the synthesising subject, the reflecting subject, or the comparing subject. All these elements enable research students to renew those various enunciative modalities which are activated, used and reused in research writing (Foucault, 1972).

3.4.2.3 Statements to form concepts

The last concern is the discursive rules for the formation of concepts. These rules may be determined through discursive relations between three dimensions: forms of succession, forms of coexistence, and procedures of intervention. These rules, according to Foucault (1972), are not derived from the horizon of ideality nor from the empirical progress of ideas. There are several forms of succession that give rise to a concept in a domain. Successive relations are numerous, such as the orderings of enunciative series, various types of dependence of statements, and various rhetorical schemata to combine groups of statements. The forms of succession may characterise and bring a concept into view. Likewise, forms of coexistence are concerned with the

spaces from which concepts are derived. First, research students may find the field of presence characterises one and the same concept differently overtime. Then, there is a field of concomitance which draws on concepts in different domains and implying one another by analogical, modelling, or subjugated relations. There is also the field of memory in which “silent” or “archived” statements are “revived” in the delimitation of a concept. Of equal importance to the other two is “procedures of intervention”. This is more concerned with methodological issues on the operation of statements that are proper to the formation of concepts. Foucault (1972) proposed several ways statements may be rewritten through being transcribed, translated, transferred, systematised, redistributed, and authorised for use.

These three dimensions characterise the discursive rules by which concepts in a domain may be formulated. The rules for the formation of a concept have been exemplified in the field of environmental studies where the formulations of concepts on “sustainable consumption and production (SCP)” have been investigated (Gunneng, 2006). In brief, the formation of SCP concepts is subject to three rules. First, forms of succession in which SCP statements are combined through various rhetorical schemata, deductions, definitions, and descriptions. Second, forms of coexistence in which statements belonging to different discourses are valued and taken up in SCP discourses by serving either as an analogical confirmation or as a general principle. Third, procedures of intervention through which ways of rewriting, transcribing, systematising, or authorising SCP statements may generate SCP concepts differently (Gunneng, 2006). For the formation of a concept, all these forms of intervention are continuously operating on it and shaping its identity over time.

The analytic materials available in the fields of information practices and research writing suggest the benefit of the present study focusing on the identification of active or possible concepts as relevant to information practices in research writing. Thus, the present research does not interrogate how concepts are formed for use in a domain, nor does it examine their transformation in their historicity (Willig & Stainton-Rogers,

2008). As such, the three directions of discursive formations enable the researcher to easily locate the objects, particular enunciations, and concepts used in information practices. Being informed of the formation of concepts as well as the other two discursive formations assisted the analysis of evidence in the present study.

3.5 Conclusion

This chapter has reviewed Foucauldian (1971, 1972, 1978, 1994) discourse in the context of culturalist textualism (Reckwitz, 2002). It has first drawn his concept of “discourse” on a horizontal aspect which involves notions of power and knowledge. The focus in the present study was on the vertical aspect of discourse – the statement which brings about the particular modalities of existence such as the information practices in research writing. Figure 3.1 below depicts a theoretical schemata of the statement in terms of the rules going to its existence and its use in characterising enunciative function in the discursive formations of objects, enunciative modes, concepts, and strategic choices.

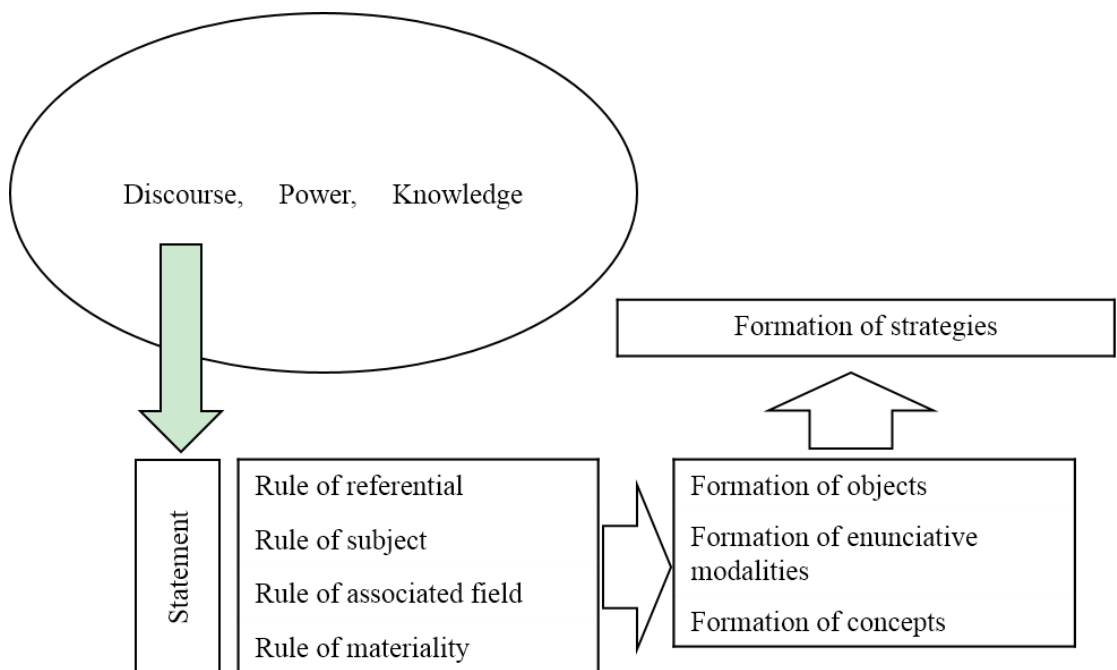


Figure 3.1 A schemata of statement

Foucauldian Discourse Analysis is both the theoretical and methodological stance used in this research. The next chapter will demonstrate methodologically how Foucault's (1972) concept of the statement is used in the analysis of information practices in Asian PhD students' research writing.

Chapter 4

Mapping an Analytical Tool of Information Practices

4.0 Introduction

This chapter reports on methodological issues that are relevant to the exploration of East Asian doctoral students' information practices in research writing and the development of the theoretically and pedagogically significant framework for information practices in research writing. It specifically focuses on how Foucault's (1972) theory of statement along with the key concepts reviewed in the literature on information practices have been used to inform data collection and specifically for data analysis. This chapter begins by reviewing the key research methods (Bogdan & Biklen, 2009; Charmaz, 2006; Creswell, 2013; Malcolm, 2013), including narrative research, phenomenological research, the Grounded Theory research, ethnographic research, and case study research to explain and justify approach taken in this thesis. In this chapter there is a section on Discourse Analysis, which is the main method used in this study. The planning of the study in terms of data collection, validation, and generalisability is also explained and justified.

4.1 A general review of qualitative research approaches

There is a range of research methods that are applicable to specific contexts and inquiries. Typical qualitative approaches include narrative research, phenomenological research, the Grounded Theory research, ethnographic research, and case study research (Creswell, 2013; Malcolm, 2013). Narrative studies usually begin by investigating individual research students' experiences through life stories (Creswell, 2013). Storytelling may either be recorded by the participating research students themselves (autoethnography) or through the researcher's field notes about a research student's experience. In either case, individuals' information practices and research

writing capabilities are explored through the narration of their experiences of an instance or series of instances (Creswell, 2013).

Phenomenological enquiry attempts to understand the common meaning construct of a particular phenomenon such as information practices in research writing. This is different from narrative inquiry that focuses on individuals' lived experiences (Bogdan & Biklen, 2009). This approach focuses on a phenomenon that is jointly experienced by a group of research students (Creswell, 2013). According to this understanding of a phenomenon, it may be studied either through hermeneutic phenomenology or transcendental phenomenology. The key difference between the two phenomenological approaches is the way in which the account of a phenomenon is produced. In hermeneutic phenomenology, the production of an account of a phenomenon is a constructively interpretive process, while in transcendental phenomenology the researcher sets aside participants' experiences and describes the phenomenon as observed (Creswell, 2013; also see Bogdan & Biklen, 2009).

A third research method is the Grounded Theory Approach, which aims to develop a theoretical account of the information process and actions of research writing (Creswell, 2013). The derivation of a theory is not based on established theories but is grounded in empirical data which is constantly compared to similar cases in the research setting (Glaser & Strauss, 1967). The Grounded Theory has undergone a transformation over the decades. In its early version, an almost positivist stance was valued for achieving a comparable significance (Charmaz, 2006). However, in the early version of the Grounded Theory, the tension between the objectivist view towards external reality and the constructionist nature of theory development was not properly addressed (Charmaz, 2006). Epistemologically, the constructivist version of the Grounded Theory differs from the orthodox Grounded Theory. It now embraces multiple and complex realities and thus emphasises an interpretive stance in theory development (Creswell, 2013).

Ethnographic research is a fourth approach. It is interested in the description and interpretation of the patterns of values, behaviours, or language of a cultural-sharing group such as research students (Creswell, 2013). There are certain commonalities between ethnography and other research approaches. These approaches all concern the understanding of a particular phenomenon or value that is inscribed in individual research students' actions or beliefs. However, differences between them are as follows. First, the research subject is different among these approaches. Narrative research usually focuses on one particular subject, that is, a research student in terms of his/her life stories. The latter three approaches are concerned about a group of research students. However, the subjects in phenomenology and the Grounded Theory are not necessarily located in the same place or interacting and sharing common cultural values, behaviour, and language (Creswell, 2013). In contrast, ethnography is concerned with these patterns in a cultural-sharing group. Second, there is difference in the ways of applying established theories. For narrative inquiry, phenomenology and ethnography, theory plays an important role not only as a point of departure but also as tools for the researcher to observe and interpret the behaviour or beliefs of individuals. Different from these approaches, the Grounded Theory aims to develop a substantiated theory based on evidence of a phenomenon or group of individuals studied. Established theories may be used in the Grounded Theory but are enacted at a later stage or have a peripheral position. The substantiated theory is developed through data-driven analysis and is then compared with established theories to further render it to be of more general relevance (Charmaz, 2006).

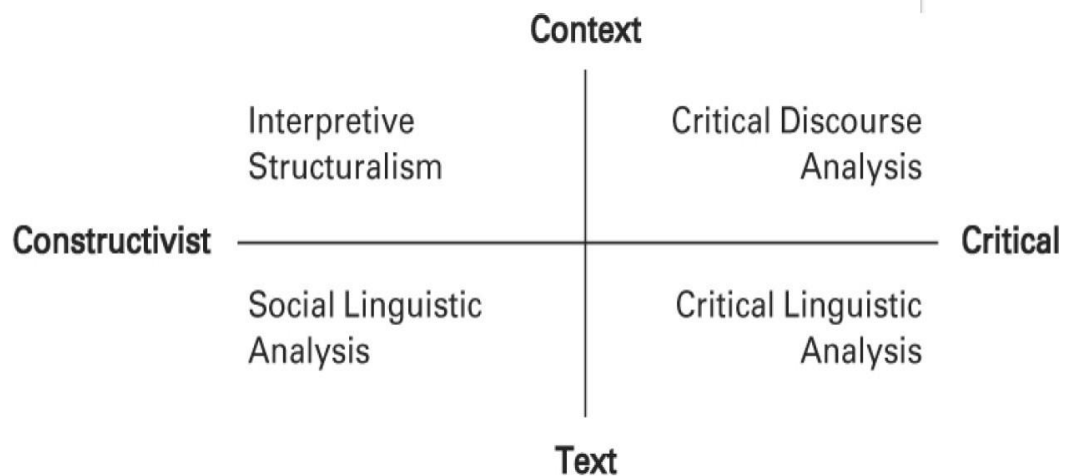
The last of the commonly used research approaches considered here is the case study. A "case" in case study research can be in various forms such as an individual, a small group, or a specific project (Creswell, 2013). Usually, a case as such is bound by a specific place and time and can be described within certain parameters. The intent of a case study is to render an in-depth understanding of a unique case itself, or of an issue that the case selected best represents (Creswell, 2014). Hence, developing an in-depth understanding entails researchers collecting various forms of data within the

case or group of cases. These may include interviews, observations, documents and/or audio-visual materials (Creswell, 2013). The all-round forms of data conducted and analysed within a case are essential to a good case study.

The above review of the key research approaches has helped to position the research method used in the present study. The selection of a research approach is closely related to the intent of a study, which in the present study was to identify forms of information practices in Asian doctoral students' research writing. The various types of information practices, as construed in the discourses of research education and LIS (ACRL, 2000, 2014; Boote & Beile, 2005; Bruce, 2001; Bundy, 2004; Holbrook et al., 2007), seem to be best found in individuals' research papers. Hence, this research does not involve individuals' accounts of this particular issue. Collecting personal accounts on a research problem is an important research strategy in all of the five research approaches. However, these research approaches do not properly fit in the present research context. This study required an alternative research approach, namely one that captures the information practices out of written texts in research writing, and also locates the information practices in a wider discursive field. This research focus suggested "Discourse Analysis" as a more appropriate research approach to the present study.

4.2 Positioning the research approach within Discourse Analysis

Discourse Analysis investigates the use of language in a social context (Malcolm, 2013). There are, of course, different versions of Discourse Analysis underpinned by different theoretical assumptions (Nikander, 2008). Figure 4.1 is a depiction of the classifications of Discourse Analysis.



Source: Adapted from Nikander (2008, p. 414)

Figure 4.1 Types of Discourse Analysis

Figure 4.1 classifies Discourse Analysis along two axes: first, the degree to which the emphasis is on individual texts or on the surrounding context, and second, the degree to which the research focuses on power and ideology as opposed to processes of social construction. However, the divides between context and text, constructivist and critical are more heuristic than they are fixed. For instance, Gee's (1993, 2005, 2011a, 2011b) discourse theory can be located in the "social linguistic analysis" category in which language is considered a social practice and used for achieving certain purposes. However, his work also suggests how language may enact a wider sociocultural context and the power relations therein it.

Gee (1993, 2005, 2011a, 2011b) has developed several discourse analytic tools that can be used to analyse the meaning of language. The analysis of the effects of meaning contains two key ramifications. First, it analyses how research students present meaning to build things – such as written accounts of research – in the world. Research students, either consciously or unconsciously, achieve various purposes through the communicative processes as might be expected in the information practices used in research writing. Gee (2005, 2011a, 2011b) described seven "building tasks" that any language involves, namely significance, practices/activities, identities, relationships,

politics, connections, and sign systems and knowledge. Thus at the same time, when research students are using language to accomplish certain things, they can also be expected to be engaging in, and subject to wider discursive resources that have already been created and that have constantly been enacted, consciously and unconsciously, here and there, in various communication processes. This is the second ramification of analysing the effects of language use. These two ramifications suggest that language use is both pushing and pulling things into and out of the world. It is significant to understand these ramifications of language use, as it moves our understanding beyond a text *per se*, through engaging in a loop of subjectification, consciousness, transformation, and doubtfulness.

The present study, by applying and testing Foucault's (1972) concept of statement, was largely located in the "interpretive structuralism" category. Discourse Analysis as such does not focus on individuals' research texts and their influence in specific fields of knowledge that can be better investigated through Gee's (2005, 2011a, 2011b) work of language building tasks. Moreover, this study also did not interrogate the power relations in the research students' writing. This can be addressed through the Critical Discourse Analysis (Nikander, 2008) by giving critical explanations for the formulations of specific writing practices in literature reviews. The investigation of power relations in terms of a system of discourses in the construction of a literature review text is not possible without the understanding of potentially available discourse itself. However, the link between information practices and research texts is at an early stage of investigation which entails the need to unearth the relevant discourses on information practices for research writing. Hence, this study explored the potentially available discourses as related to PhD students' information practices through their research writing. These discourses were not only explored but also regrouped into a relatively fuller framework which can be used to interpret research students' information practices in research writing. The following section reports upon the general principles of this research.

4.3 Research principles

This section reports some of the principles that guided the research reported in this thesis. These principles were employed to enhance the rigour of this study. As such, consideration was given to the validation of the study, research ethics, and the generalisability of the research results.

4.3.1 Validation of the study

Validity deals with the research results or findings in terms of the extent to which they are genuine, authentic and sound (Malcolm, 2013). Although this definition is only concerned with the quality of the results of a research, validation can be interpreted from various perspectives. The orthodox perspective on validation holds that it is necessary to identify equivalents that parallel the validity criteria across various studies of different types (Creswell, 2013). The use of positivist terminology facilitates the acceptance of some studies. This perspective on validation values such terms as “objectivity”, which is socially and politically recognised as significant for research. However, the sociocultural complexity of any and all research entails developing alternative perspectives on validation.

In this research, validity was supported by external audits (Creswell, 2013). This validation strategy looks for dependability and confirmability rather than solely objectivity to establish the value of the data. In a sense, the team of researcher associated with this study played a key role in scrutinising both the process and results of this study. This strategy enhanced the trustworthiness of this study in terms of accuracy of the interpretations and conclusions made of the data. When this happened in the auditing process, the researcher’s own interpretations were supplemented with these different analyses. Thus, where there were disagreements between these external auditors and the researcher on the interpretation of data, these tensions were used to develop more nuanced accounts in reporting the findings of this study.

This research adopted “thick description” as a strategy to further enhance the validity of this study (Creswell, 2013). This validation strategy entails describing the data in sufficient detail. With regard to the present study, evidentiary excerpts were selected for analysis. These evidentiary excerpts, selected from PhD students’ (n=7) literature review sections of their completed thesis, were analysed in detail in terms of their contextual positions within the theses, and also information practices with respect to literature coverage and use. Hence, by using rich and thick description to convey findings on doctoral students’ information practices in literature reviews, this study demonstrated a fuller picture of the data for evaluating its validity, and also enabled the readers to ponder the transferability of this study to their own situations. The issue of transferability of a study is further considered in the next section on generalisability.

4.3.2 Generalisability

Generalisability in Discourse Analysis studies depends on the possibilities of different interpretations (Talja, 1999), but is not meant to provide dogmatic answers to the questions posed. This study adopted an interpretive stance that conceives the results as subject to change and instability (Creswell, 2013). This required a research approach embracing a “specimen” perspective instead of the “fact-driven” perspective that relies on copious data’s accurate representation of reality. In contrast, the specimen perspective employed in this study focused on the text itself in manifesting different versions of reality. Talja (1999, p. 13) argued that “all forms of talk and texts represent situated speech which provides evidence of the various ways in which a particular phenomenon can be approached. Research data do not describe reality, but are specimens of interpretative practices”. Thus, the generalisability of Discourse Analysis undertaken for this study was not based on the quantity of data. Even one piece of text can be generalised as long as it reflects one version of the studied practice.

This research drew on information practices relating to research writing (ACRL, 2000, 2014; Boote & Beile, 2005; Bruce, 2001; Bundy, 2004; Holbrook et al., 2007), albeit with certain limitations. It exclusively focused on only East Asian PhD students' information practices in an Australian higher educational context. Moreover, the study looked only at disciplines in social science. Hence, this research provided one possible interpretation of these particular PhD students' information practices and research writing. Its findings may or may not apply these practices in different cohorts, contexts or disciplines. Nevertheless, it did "raise new possibilities, open up new questions, and stimulate new dialogue" (Creswell, 2013, p. 248) about the research issues at stake in this thesis.

4.3.3 Ethical considerations

Ethical issues are usually considered when a study involves human or animal participants. Even though such concerns do not fall within the scope of document analysis, the present research was nonetheless concerned with ethical issues. This concern arose because the documents under analysis in this study were written by identifiable individuals. The analysis presented in this study was not designed to assess the quality of the authors' work. Rather, it focused on the texts themselves as representations of various discourses of information practices that are operating in academia.

4.4 Data collection

This study focused on analysing textual archives. Specifically, doctoral students' literature review chapters constituted the data set for this research. The sampling method for collecting this group of data was both purposive and convenient (Malcolm, 2013). A purposive sample was selected to delimit the variables addressed in this study. The present study aimed to identify the statements of information practices in the construction of literature reviews and tried to shed light on the PhD students'

information practices in research writing. However, this study was not to offer a basis for the generalisation of information practices to PhD students as a whole. It was merely sort to “explore and understand the topic under investigation” (Malcolm, 2013, p. 47) by looking at East Asian PhD students’ information practices in Australian academia. Moreover, information practices in research writing is assumed to vary by disciplines (Hillocks, 2005, Research Information Network, 2008). This study delimited the data collection specifically to doctoral theses completed in the social sciences. Hence, the literature review chapters collected for this study were written by East Asian PhD students who completed doctorates in the last ten years (2007-2011) in the social sciences in Australian universities.

The sampling method was also convenient with regard to data access. The data were collected by accessing the online library in each university throughout Australia (n=39). Specifically, this means accessing the “thesis database” section where the doctoral theses of each university were published and can be accessed globally. The identification of Asian PhD students was another issue of concern for this study. These were identified first by their authors’ names, given that “Asian” names are uniquely spelled, and can be differentiated from Anglo-Saxon names. However, it should also be noted that a limitation existed, that is, there was a possibility that some Asian PhDs did not use their Asian names and so were not even considered for inclusion in this study. The information about each doctoral candidate’s research location, backgrounds and the universities where they completed their Bachelor and Masters’ degrees were used as indicators when selecting the theses. As a result, seven literature review texts were identified from the theses written by authors from East Asian countries or regions, one from each of mainland China, Hong Kong, Japan, Singapore, South Korea, Taiwan, and Vietnam.

The seven literature review texts were concerned because they were each in different areas of research in the social sciences. The Japanese author Otsuji (2008) conducted cross-cultural research on individuals’ transculturation of language, identities, and

culture. Nguyen (2011), a Vietnamese author focused on gifted education in which gifted students' moral reasoning was examined. Hwang (2008), a Korean author, studied autism in the field of special education. Chung (2009) from Taiwan was concerned with HIV/AIDS curricula in the area of social work education. Hong Kong author Leung's (2007) research was a study of peer tutoring in the context of the social support domains. Lastly, the authors from China and Singapore conducted research into mathematics education, albeit each with different emphases. Jin (2011) investigated Chinese teachers' perspectives and practices in mathematics education. Leong's (2008) study was about geometry teaching and learning in the context of Singaporean educational reform.

4.5 Data analysis

The central issue for this research was how Foucault's (1972) conception of statements can appropriately be tested and used to address empirical topics such as information practices and research writing. This "how" question was closely related to the data analysis. This study explored East Asian background PhD students' information practices in research writing through analysing literature review sections of their theses. The literature review sections constituted the essential data sources for this study. Within this data set, there are numerous groups of statements operating. These statements come from many different domains. The literature review for this study (ACRL, 2000, 2014; Boote & Beile, 2005; Bruce, 2001; Bundy, 2004; Holbrook et al., 2007) indicated that there are at least statements on academic writing in terms of literature organisation and rhetoric in the field of research education and those statements concerning information literacy in LIS. This research directly applied Foucault's (1972) theories to the analysis of literature reviews, statements may be invoked not only in information practices but also of rhetoric constructions proper to writing a literature review. Thus, to focus on the enunciative functions of statements of information practices in research writing, this required a substantial framework which exclusively consists of statements of information practices that can be used for

the analysis of literature reviews. This research has developed a working framework through the empirical and theoretical lenses in Chapters 2 and 3, and is summarised in the following section.

4.5.1 A working framework for data analysis

Drawing on the literature reviewed about research education and LIS through Chapter 2, the following framework (Figure 4.2) was developed. This framework consists of three interrelated parts.

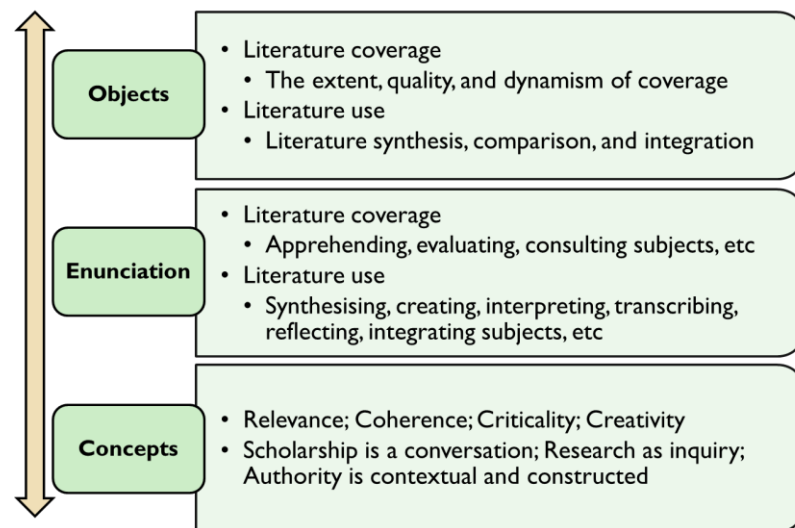


Figure 4.2 A working framework of information practices

The analysis of information practices in research writing presented in this thesis focused on three areas, namely the information practices with respect to (a) subject vocabularies and topics; (b) research phenomena and variables, and (c) methods and methodologies. The working framework (see Figure 4.2) was used analytically to examine the particular objects, enunciative modalities, and concepts evident in each area of the literature review in the theses.

4.5.1.1 Objects of information practices

The objects relevant to information practices in research writing in the data are “literature coverage” and “literature use”. Each object consists of specific sub-objects or attributes as stated in the discourses of research education and LIS (ACRL, 2000, 2014; Boote & Beile, 2005; Bruce, 2001; Bundy, 2004; Holbrook et al., 2007).

Discursive object: Literature coverage

The statements in research education and LIS characterise literature coverage as having three attributes, specifically the extent of literature coverage; the quality of coverage, and the dynamism of coverage. Statements from research education (Boote & Beile, 2005; Bruce, 2001; Holbrook et al., 2007) articulate the extent of literature coverage. According to Bruce (2001), the coverage of literature can range from the subjective and objective approaches. These statements give rise to many notions constituting each approach. They articulate how and to what extent the relevant literature can be drawn to establish an explicit relationship with the research problem. Although statements in LIS (ACRL, 2000, 2014; Bundy, 2004) do not fully define the extent of literature coverage, some statements complement the characterisation of the concepts in the literature coverage. For example, there are statements in LIS providing more articulations on the notion of availability (ACRL, 2000; Bundy, 2004). Availability in research education refers to the accessibility of locally available material, while statements in LIS substantiate it more in terms of whether the information seeking process should be broadened beyond local resources (ACRL, 2000). The latter can include the acquisition of a new language or skill for accessing more information, and developing a feasible plan for information retrieval. In this sense, statements in both the fields involve articulation of the extent of literature coverage.

Another aspect of discursive objects is the quality of literature coverage. The extent of literature coverage mainly addresses the relevance of the information and the research problem, while it is the quality of information that makes the relation to relevance possible. Therefore, to a certain extent, information quality shapes if not determines the quality of literature coverage. In reference to IL frameworks (ACRL, 2000; Bundy, 2004), information quality includes the quality of the information *per se*, and also its sources. The retrieval of accurate, valid and reliable information for literature coverage involves statements on the recognition, apprehension, and evaluation of information and its sources. These statements on the quality of information and its sources complement the articulations about the quality of coverage in research education (Boote & Beile, 2005; Bruce, 2001; Holbrook et al., 2007).

The dynamism of literature coverage is the third attribute identified as characterising discursive practices. The statements in research education do not articulate this attribute fully (Boote & Beile, 2005; Bruce, 2001; Holbrook et al., 2007), while it is described in LIS in the IL frameworks (ACRL, 2000; Bundy, 2004). Information is processed in two ways. First, the user, in this case research students, produces new information through the analysis of the research literature. The process of producing knowledge from the existing research literature can provide more information that is potentially relevant to the doctoral students' research problems. Second, this attribute refers to the process of literature coverage itself. Literature coverage is not a linear process. It does not start from information need and end up with a research problem being articulated based on the selection of literature. Rather, literature coverage is a cyclic or iterative process involving constant reflection, re-evaluation, and refinement of the research literature to be selected and excluded depending on (a) the evolving review itself; (b) the emergent theoretical frameworks; (c) the developing methods and methodologies, and (d) the actual analysis of the research evidence.

The discussion above has mapped key attributes relevant to the coverage of literature. Figure 4.3 demonstrates the constitution of "literature coverage".

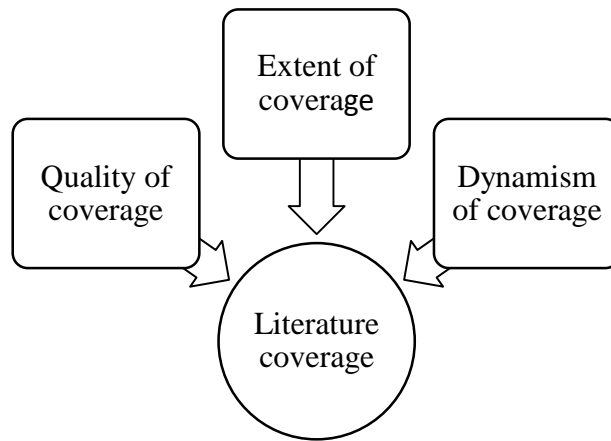


Figure 4.3 Attributes constituting literature coverage

These attributes of literature coverage are articulated by and derived from the statements in the fields of research education and LIS. Likewise, attributes of literature use are also found in the discourses of these two fields.

Discursive object: Literature use

The attributes contributing to literature use as a discursive object include “literature synthesis”, “literature comparison”, and “literature integration” (ACRL, 2000; Boote & Beile, 2005; Bundy, 2004). They may be considered as different levels of synthesis in a literature review. Figure 4.4 below demonstrates the organisation of these attributes.

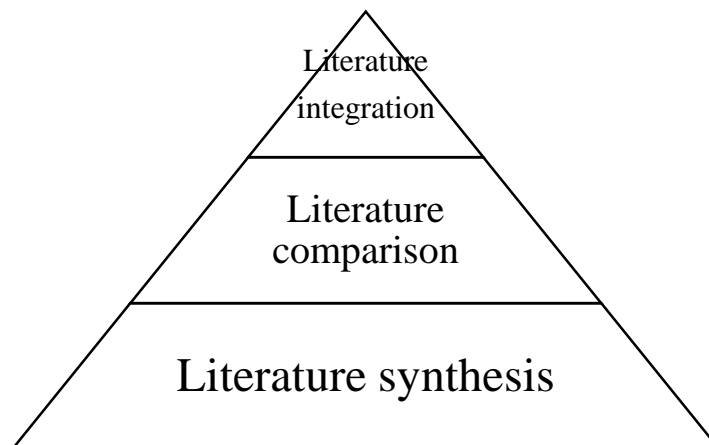


Figure 4.4 Attributes constituting literature use

Figure 4.4 indicates that literature use can be studied in a domain within which it is characterised by several elements. The first attribute is literature synthesis. As Figure 2.2 in Chapter 2 indicates, literature synthesis may take place at the level of, or framed in terms of field, topic and history. Information synthesised from these levels in literature reviews accounts for subject vocabularies, variables and phenomena and methodologies. Additionally, the synthesis of previous information is expected to generate new ideas, perspectives, hypotheses and significance (Boote & Beile, 2005). The literature synthesis is derived from the statements in the field of research education. However, in research education, there has been insufficient examination of the relation between the new perspectives derived from prior literature, and the relation between the literature review and the whole research project. These concerns can be addressed via statements in LIS (ACRL, 2000, 2014; Bundy, 2004).

The second attribute, “literature comparison”, addresses the necessary comparison between the newly derived knowledge and prior information. This comparison enables the positioning of new knowledge in the repertoire of prior information. In the context of literature reviews, a comparison can be established between the potential derivation of new knowledge and prior literature. The third level of synthesis is “literature integration” which is addressed in the field of LIS. Statements on literature integration suggest the positioning of the literature synthesised in the holistic research endeavour (ACRL, 2000; Bundy, 2004). The review of literature is not a single one-off practice in a study, but is enacted via a wide ranging relationship among the literature and research problems, purposes, significance, theory, methods and evidence. The researcher has mapped attributes relevant to the object of literature use. It is these attributes working together that literature use is delimited and named as a discursive object.

To sum up, the objects “literature coverage” and “literature use” are derived from and characterised by the statements in both the fields of research education and LIS. These

statements articulate literature coverage in terms of its extent, quality, and dynamism, while literature use is constituted by such elements as literature synthesis, literature comparison and literature integration. Mapping the elements in these objects helped to examine how these elements were enunciated in the research students' literature reviews. The following section addresses another analytical tool used in this study, namely enunciative modalities.

4.5.1.2 Enunciative modalities of information practices

The enunciative modalities consist of the enunciation of literature coverage and of literature use. As noted above, literature coverage can be assessed in three ways, specifically the extent of coverage, the quality of coverage, and the dynamism of coverage (ACRL, 2000, 2014; Boote & Beile, 2005; Bruce, 2001; Bundy, 2004; Holbrook et al., 2007). Each part of the analysis can consist of several subject positions where individual research students occupy and perform various enunciative modalities. The analysis of the other part of enunciative modalities takes place on literature use. Similar to literature coverage, there are three types of literature use, namely the synthesis of literature; the comparison between newly obtained ideas and prior literature, and the integration of the chunk of literature into the students' research. These types of literature use also correspond to specific enunciative modalities that are circulating in them. These subjective positions in each group of information practices can be numerous. Therefore, this thesis illustrated merely some of the key subject positions that were at stake in the information practices. The research students may occupy these subject positions throughout their research writing.

Enunciation of literature coverage

The subjective and objective approaches to literature coverage may enable research students to perform as evaluating subjects. Research students may occupy this subject position when evaluating the appropriate approach to the collection of information.

For example, research students might be concerned with questions as to whether information should be current or not, whether information beyond the topic scope should be sought, or how much information should be reviewed for the research problem. These questions require research students to perform the evaluating subject with respect to literature coverage.

With regard to the quality of the literature coverage, research students may also occupy several enunciative positions in relation to the understanding and evaluation of information and its sources. As to information understanding, the summarising-and-interpreting subject is concerned with the appropriate understanding of the literature. Research students may also, if necessary, enact the consulting subject to confer with others (peers, supervisors, or librarians) on the interpretation of particular literature. The group of subject positions connected with the enunciative modalities are called “working understanding” (Holbrook et al., 2007) in research education. These positions can foster the identification of the coverage of literature that will be used for addressing research problems. However, the enunciative modalities of working understanding alone may not guarantee a higher degree of quality in literature coverage.

Enunciative modalities on “critical appraisal” (Holbrook et al., 2007) is the other part of statements on the quality of literature coverage. Statements on the evaluation of information and its sources from LIS provide specific subject positions that research students may occupy in the enunciation of critical appraisal. Thus, to identify the nature of a literature source in terms of its organisation and dissemination in a cultural or physical context, research students have to become the recognising subject; and when appraising the content of literature in terms of its structure, logic, manipulation, as well as the interpreter’s own limitations in terms of knowledge, research students become evaluating subjects. The quality of literature coverage can be actualised by research students occupying various enunciative positions on the modalities of understanding and evaluating literature and its sources.

The last part of literature coverage concerns research students' dynamism in their selection and exclusion of information. As noted earlier, the consideration of literature coverage as being procedural is manifested in two ways – the treatment of extant literature and the process of locating potential literature. The former practice puts research students in the position of the analysing subject. Specifically, research students can go through an analytic process by probing the literature at hand at a deeper level. Through the experimentation or technological strategies, research students study the interaction of data within the existing literature and derives new ideas from it (ACRL, 2000). Thus, literature coverage does not only include individual articles, but the process to derive new information from primary literature provides another source. This process of identifying further information is another means for research students to develop an understanding of the information, becoming another type of enunciative modality available to them as interpreting subjects. The latter practice – the process of locating potential literature – requires research students to be planning and reflecting subjects. The planning subject develops steps through which the need for information can be fulfilled, while within this process research students may act as the reflecting subject to constantly revise or check the appropriateness of the practices involved. In a sense, research students might be expected to reflect the extent to which existing literature may articulate their research problems; rationalise the decisions they have made about literature choices; and/or adjust the questions for obtaining further literature. Research students may constantly involve these subject positions since the practices of these roles are indispensable to the development of a literature review process.

Enunciation of literature use

This section concerns the enunciative modalities relevant to literature use. In the first type of literature use, the synthesis of literature involves enunciative modalities of information understanding and evaluation. To enunciate the synthesis of the literature, research students are expected to be synthesising and creating subjects, and also to be

the interpreting and evaluating subjects. The latter two subject positions have been articulated above in the relations of these positions to literature coverage. These subject positions in relation to the enunciation of literature use will not be unfolded here as they are similar to the ones in literature coverage. Enunciation of the synthesising and creating subject can be found mostly in the statements on literature synthesis from the field of research education (Boote & Beile, 2005; Holbrook et al., 2007). Research students are expected to synthesise the literature at the levels of field, topic, or history so as to articulate such aspects as subject vocabularies, variables and phenomena, and methods. Based on this synthesis, research students may, for example, generate or make explicit the ambiguities between vocabularies; create certain (unexpected) interrelations between variables or phenomena from literature, or offer new perspectives.

The second type of literature use is the comparison between newly derived knowledge and prior literature. This comparison requires research students to take up the reflecting subject position in order to examine the relationship between their new knowledge and the prior information, by warranting the validity of the new and prior knowledge. In the context of academic discourse, the reflecting subject is concerned with new knowledge in terms of whether, and to what degree this knowledge confirms or contradicts the synthesis of the literature. To examine the validity of new knowledge, research students are expected to reflect on the process of its generation. This includes a review of prior literature, and their sources; identifying the limitations on the coverage of literature, and explaining the potential for further research to produce the new knowledge. The comparison of new knowledge with prior literature may increase the degree of credibility when certain claims are made through the synthesis of literature.

The integration of chunks of literature into the students' own research is the third type of literature use. Statements from LIS mainly focus on the integration of new knowledge into student's value system. In the literature review, this implies that the

discussion of the literature should not be limited to the literature itself. The review of the literature should be situated in the wider intellectual space of use in which its relation with the research problem should be defined. This might be exemplified when the literature review is integrated into the research project by articulating the extent to which the review of literature addresses the research problem and how the disparities identified from the review are incorporated in the later part of study concerned with actual data analysis.

Information integration can also be found in the synthesis of research methods or articulations of research significance. With regard to research methods, research students may be expected to act as the synthesising subject to synthesise information of prior methods and theories used in addressing similar problems. It is the integrating subject who is concerned with the implications of the advantages and disadvantages of existing research for the research being proposed or conducted. The integrating subject, thus, can make decisions about the suitability of the research method to be used for the current study. As to research significance, rationalising the practical and theoretical significance of a research project is relevant to the integration of prior research into the students' current studies. The possibility to articulate significance arises because research students may identify the inconsistencies and limitations of prior studies and link them to the justification and mapping of the research project in the wider domain of research practices.

So far, in analysing the data in terms of literature coverage and use, two components of the working framework have been addressed, namely the objects and enunciative modalities. To interweave these two components into the research reported in this thesis, there are some key discursive concepts (Foucault, 1972) identified in research education and LIS that also proved useful for analysing the data in this research.

4.5.1.3 Concepts in information practices

In this section, the concepts derived from the fields of research education and LIS are combined by contemplating their use in information practices of research writing. The concepts in research education are “relevance”, “coherence”, “criticality”, and “creativity” (Boote & Beile, 2005; Bruce, 2001; Holbrook et al., 2007), while the concepts in LIS have already been demonstrated in terms of “Scholarship is a Conversation”, “Research as Inquiry”, and “Authority is Constructed and Contextual” (ACRL, 2000, 2014; Bundy, 2004). These concepts are caught in the enunciative field in which the statements on research writing coexist and perform a certain role (Foucault, 1972). The statements characterise the formation of each concept, and also establish the interrelations between the concepts themselves. It is this complex enunciative web that shapes if it does not determine the enunciation of literature reviews.

Relevance in research education

First, consider the concept “relevance” in research education and its relationship with the LIS concepts (ACRL, 2014; Bruce, 2001). Relevance is a concept that situates itself in the discursive relations of literature reviews. Statements that directly involve relevance can be found in literature coverage and also in literature use. Relevance is manifested in the notions of the subjective and objective approaches to scope, namely “breadth”, “relevance”, “exclusion”, “authority”, “topicality”, “comprehensiveness”, “currency”, and “availability”. This also occurs in the articulations of literature use. The most significant of which are the synthesis at the field, topic and historical levels as well as the synthesis of important variables and phenomena. These elements are important to the coverage and synthesis of literature. They are considered as statements since they appear and form a complex web in the enunciation of relevance, referring to each other, and determining subsequent possibilities for the formulations of relevance (Foucault, 1972). For the enunciative function of a single statement in this

complex web, Foucault (1972) said that “a statement always belongs to a series or a whole, always plays a role among other statements, deriving support from them and distinguishing itself from them: it is always part of a network of statements, in which it has a role, however minimal it may be, to play” (p. 111). The following paragraph describes some interrelations between statements in the conceptual formation of relevance.

This description starts with the notion of breadth. This notion characterises the relevance of information beyond the limitations of the research field. This characterisation forms a concomitance with other statements. For example, although breadth and comprehensiveness belong to different approaches to the coverage of literature, they may both seek relevance beyond the scope of the research field. Moreover, statements belonging to different domains may also be concomitant with each other. Breadth is a notion belonging to the coverage of literature and “synthesising literature at the topic level” is a statement subject to the synthesis of literature. The statements may have enunciative functions on different objects, while they both refer the idea of relevance to the inclusion of potential information beyond the research field. In actuality, statements may also form a relation of dependence. Take the example “comprehensiveness”, this notion can provide a modification of “breadth”. Comprehensiveness can characterise the extent to which research students include information from other fields – how far they extend the scope of information and whether it has to be exhaustive or not. In that sense, the coexistence and orderings of these statements determine the possible consequence of relevance. The notion of breadth may also formulate an opposite relation with other statements. This relation may be found between breadth and topicality.

The opposite to breadth, topicality characterises the relevance of information limited to the research field. Although they are disparate notions, they may be present at the same time in the enunciative field of relevance and give rise to different forms of relevance. The discursive relations being enacted around the notion of breadth may

also be found in other notions. For instance, with regard to the concomitant relationship, “comprehensiveness” and “the synthesis of literature at the historical level” may both conceive relevance as explicitness of historical information around the research topic. “Currency” and “availability” may define the boundaries of “comprehensiveness” and thus form a relationship of dependence. This is also the case between the notions “relevance” and “authority”, since authority may distinguish the level of relevance of information by importance and significance. There are also statements that oppose or conflict with each other, as do the notions of “relevance” and “exclusion”, or “comprehensiveness” and “currency”. These relationships are complex and numerous. Thus, the formation of an enunciative web where the concept of relevance is to be designated and its various formulations construed proved to be challenging.

Relevance with concepts in LIS

Although the concepts “Scholarship is a Conversation” and “Research as Inquiry” may concern different groups of information in a literature review, both emphasise engagement with a repertoire of information/knowledge sources in relation to the problem being researched (ACRL, 2014). However, the two concepts do not address specific relations between literature and research problem. The question of how different sources of information can be grouped as an information/knowledge base in relation to research problem is left unsaid. This question, nonetheless, enacts an area that the concept relevance is concerned with. Relevance prescribes various possibilities of connections between different information sources. As described in the former section, relevance is manifested through the subjective and objective approaches to the coverage of literature (Bruce, 2001). Relevance is found by these different approaches which make explicit how a repertoire of information/knowledge sources can be retained. The point at which the concept of relevance may be relevant to and connected with the concepts of “Scholarship is a Conversation” and “Research as Inquiry” has been suggested. This relationship between them demonstrates a form

of coexistence in which relevance becomes an element “silently” anticipating these two concepts (Foucault, 1972).

Likewise, there is similar relation between relevance and “Authority is Constructed and Contextual”. The most immediate connection between them is the description of authority. Authority is one of the notions signifying the concept of relevance. It characterises relevance in terms of seeking fundamental information on the research problem. The concept “Authority is Constructed and Contextual” (ACRL, 2014), however, is concerned with authority itself. The credit that authority is given in different conditions and its status are subject to change if not debate and contestation. Hence, the relationship between the two concepts is found at this point. In terms of authority, this also suggests a form of coexistence among the concepts relevant to information practices in literature reviews.

Coherence in research education

Coherence is similar to relevance. The existence of the two concepts is based on the relationship between the information included and the study undertaken. Yet, coherence may be seen as a specific performance of relevance. Through the concept of relevance, research students may perceive relevant relations between information and research, while it is the concept of coherence that explains the rendering of the specific organisation between them. In the evidentiary chapters (Chapters 5, 6, and 7), the analyses include evidentiary excerpts that deal with coherence. These evidentiary excerpts demonstrate different forms of organisation where the information collected coheres with the PhD students’ research projects.

Holbrook et al. (2007) wrote that coherence is interpreted from two perspectives: “Ability to select literature and position it in a way that advances an argument; and misuse or underuse of references in support of the argument” (p. 345-346). For the first articulation, coherence is manifested through the extent to which information use

may advance the argument in a literature review. This formulation of coherence is “enunciated” by statements in an enunciative field. This field contains statements that may presuppose each other; coexist with one another; form effects of series and succession, and distribute themselves with particular functions and roles (Foucault, 1972). For example, there is a form of succession between statements. This is because the establishment of an argument is based on the synthesis of literature, while the synthesis of literature is made on the basis of appropriate selection of information, namely the coverage of the literature. There is also a form of schemata to be found, for example, in the synthesis of literature. As indicated above, statements on synthesis are combined in a certain way as a formation of enunciative modalities of the literature synthesis. Moreover, there is a form of coexistence between statements. This can be exemplified by statements on the coverage of literature. Both statements on the subjective and objective approaches to scope coexist and determine the various formulations of the coverage of the literature. Thus, the concept of coherence is situated in a complex enunciative web that involves several elements being related to one another. This concept is comprised of statements on the coverage of literature that they may appear and form elements in it; and is also referred to by statements on the synthesis of the literature that are modifying various formulations of it (Foucault, 1972). This concept explains the multiplication of the statements on both the coverage and synthesis of literature.

Another important aspect of coherence is the accurate use of information. This involves accurate use of the literature as well as the accuracy of references that may support the argument in a literature review. Statements that may be of immediate relevance with this formulation of coherence are “working understanding” (Holbrook, et al., 2007) and “availability” (Bruce, 2001) (also see the specificities of these statements in sections 2.4.1.2, 2.4.1.2 in Chapter 2, and 4.5.1.1 in Chapter 4). Both of these statements coexist and are present in the enunciative fields of literature reviews. They formulate a type of dependence with coherence and support this concept (Foucault, 1972). For example, “working understanding” may appear as an element in

formulating the accurate use of information. It also determines the possible consequence of this formulation, as the accurate use of information is based on solid knowledge and a good understanding of information. Similarly, the accurate use of information is a successor following the statement “availability” (Foucault, 1972). The accurate use of information is not possible without the precondition that information is physically and locally accessible. Research students may use information without knowing its exactitude or origin. This is particularly the case when information is drawn from other sources rather than its original appearance. Thus, the accuracy of information is questionable when research students fail to access physically available materials. The analysis of PhD students’ literature reviews in the evidentiary chapters looks at coherence by identifying the diverse formulations or manifestations of this concept.

Coherence with concepts in LIS

LIS concepts, particularly “Scholarship is a Conversation” and “Research as Inquiry”, enable research students to look at the information/knowledge base relevant to either the topics involved in a study or the research practices of the study (ACRL, 2014). However, without coherence, research students may not know how the information reviewed in a discipline or disciplines is relevant to the present study, in what respect and in what way. Hence, the concept of coherence may delimit the result to which the engagement of scholarship conversation and inquiries give rise. The review of groupings of literature may either justify a research problem, or inform a way to do the research. Coherence is found when research students use the review of literature to achieve certain purposes. As such, the relation between coherence and the LIS concepts demonstrate another form of coexistence. Coherence which characterises the subsequent possibilities of the two concepts “Scholarship is a Conversation” and “Research as Inquiry” (Foucault, 1972). The next analytical concept is criticality.

Criticality in research education

Criticality is an important conceptual tool for analysing data. Statements in the synthesis and coverage of the literature form a complex web of the enunciation of criticality. With regard to critical synthesis, the rubric for literature review prompts research students to be aware of some caveats: “critically examined the state of the field; topic clearly situated in broader scholarly literature; critically examined history of topic” (Boote & Beile, 2005, p. 8). These three levels of synthesis give expression to an enunciative schemata of criticality. The statements may be combined and constitute various enunciative successions that characterise the architecture of a critical text (Foucault, 1972).

In addition to the three levels of synthesis, identifying, distinguishing and capitalising ambiguities is another form of criticality. This can be found in statements on “subject vocabularies” and “variables and phenomena”, for example, “whether key vocabulary is discussed and defined; and whether ambiguities in definitions are discussed and resolved” (Boote & Beile, 2005, p. 8). Other examples are whether key variables and phenomena are discussed; whether relationships among key variables and phenomena are reviewed; and whether new relationships are proposed to address noted ambiguities in the literature (Boote & Beile, 2005). Critical appraisal is another aspect of criticality. This is an indicator of performance (Boote & Beile, 2005; Holbrook et al., 2007). Critical appraisal may also involve critically evaluating the appropriateness of research methodologies such as the “critiqued appropriateness of research methods to warrant claims” (Boote & Beile, 2005, p. 8), and the critical rationalisation of research significance such as “critiqued practical and scholarly significance of research” (Boote & Beile, 2005, p. 8). The presence of these statements characterises the enunciation of criticality. The choice of research methods and the articulation of research significance are enunciated through critical evaluation of the implications from preceding studies and research methods.

Criticality with concepts in LIS

There are many concepts in LIS invoking criticality (ACRL, 2014). For example, “Scholarship is a Conversation” emphasises engagement with different sources of information to understand the issue, and denies a single source of information to address a research issue. Criticality may be manifested then when research students engage in this scholastic conversation in which competing perspectives on a definition, phenomenon or variable are invoked. Likewise, through the concept of “Research as Inquiry”, research students may encounter a knowledge base where there is information including lines of inquiry, research methodologies and methods. With these abundant kinds of information, research students may evaluate the research practices relevant to his or her study and better position the study as the result of following the inquiries in the literature. The “Authority is Constructed and Contextual” (ACRL, 2014) concept is also a specific performance of criticality. In other words, criticality is also operating when research students seek authoritative information relevant to a study. Authority is not merely identified by specific publications or publishers who have gained credibility in a field of knowledge. The concept considers authority as constructed and contextual, and thus, research students need to take a critical stance on the authoritative sources of information encountered. The critical stance as specified in this concept is “an attitude of informed scepticism and an openness to new perspectives, additional voices, and changes in schools of thought” (ACRL, 2014, p. 7). From the examination of the three concepts, research students may perceive that their existence cannot be possible without criticality operating within them. On the contrary, they may be seen as specific performances of this abstract concept of criticality. They make criticality describable in the context of information practices in literature reviews. The final analytical concept to introduce is creativity.

Creativity in research education

The most likely statements that refer to the conceptual formation of creativity are the “disciplinary perspective” and the synthesis of research methodologies. The disciplinary perspective concerns generating a new perspective based either on a synthesis of the existing literature or the introduction of new conceptual tools to a field of study. Likewise, the synthesis of research methodologies makes the creativity of research methods possible: “introduced new methods to address problems with predominant methods” (Boote & Beile, 2005, p. 8). Both statements regarding new perspectives and research methods characterise various formulations of creativity. They define the subsequent possibility of creativity that either involves the possible location where creativity may appear (the synthesis of literature and methods) or the possible consequence of creativity (the generation of new perspective and method).

Creativity with concepts in LIS

Creativity may also involve discursive relations with the concepts in LIS. The concepts in LIS, particularly “Scholarship is a Conversation” and “Research as Inquiry”, may be seen as preconditions for creativity. The examination of different sources of information provides a basis with which research students may generate new ideas on an issue or research practice. Hence, these concepts in LIS may determine subsequent possibilities for creativity (Foucault, 1972).

So far, four key analytical concepts – “relevance”, “coherence”, “criticality”, and “creativity” – have been defined, and how they can be used for subsequent data analysis has been examined. The various discursive relations between these concepts in research education and LIS have also been discussed. The objects, enunciative modalities and discursive concepts as derived from the fields of research education and LIS provide a system of analytical tools used to investigate research students’ information practices in research writing. The next section reports the data analysis

procedures involved in the present study.

4.5.2 Data analysis procedures

This section describes the process of data analysis used in this study. Analysis began with an overview of each PhD thesis under investigation (n=7). Through examination of the theses, it was possible to identify what each study was about and the research area in which it was located. The research focus turned to the information practices evident in each literature review.

4.5.2.1 Identifying and naming the data

This study has analysed the literature review sections of seven theses by Asian background PhD students. One thesis written by Otsuji (2008) located the literature review in her methodology chapter. This was regarded as the literature review of her thesis and included in the data. The data regarding each author was labelled using the initial of the author's corresponding country or region. For example, Chung (2009), from Taiwan was labeled "T".

4.5.2.2 Grouping the data

The data from the literature review sections were initially identified and placed into three major groupings from which the necessary evidence was extracted, namely subject vocabularies and terms, phenomena and variables, and method-related information. This mode of data organisation was a form of "provisional coding" through which a predetermined starting list was used to allocate the data (Saldana, 2009). This provisional list was derived from the past studies, conceptual framework/s, research questions, pilot study, or the researcher's prior knowledge (Saldana, 2009). In the present study, a provisional list was created from the papers and documents in the fields of research education and LIS. Moreover, through Foucault's (1972) theory

of statement, they were further modified into a referential framework as indicated in Section 4.5.1. This working framework was used to analyse the data, while remaining open to welcome ambiguity and flexibility (Saldana, 2009). Thus, the framework was subject to change and modification as data were analysed in detail and new elements on information practices emerged.

The classification of information practices according to the parts articulated was relatively straightforward. For example, the following evidentiary excerpt was initially allocated to information to articulate subject vocabularies and terms:

A hidden curriculum, generally speaking, refers to the unspoken, unnoticed or unexpected practices, processes, experiences or outcomes outside the formal written or spoken curriculum in educational institutions (Margolis et al., 2001, pp. 1-2; Vallance, 1991, p. 40). (*T*)

Information in this evidentiary excerpt articulated the term “hidden curriculum”. Hence, this piece of data was grouped with evidence used for subject vocabularies. However, on some occasions, a text could not be allocated to any single place. This was the case of following text:

He [Gaudio, 2003] examines the ways in which global capitalism affects conversation and claims that conversation is commodified in a capitalistic society and that ideologically free and a-historical understandings of “ordinary” or “casual” conversation are invalid. He thus writes “my aim is to demonstrate how seemingly ordinary, casual conversations are inextricably implicated in sociohistorical processes associated with global capitalism (Gaudio, 2003, p. 662)”. (*J*)

From the evidentiary excerpt above, it is possible to discern information as falling into the groupings of subject vocabularies, and of research phenomena and variables. This

evidentiary excerpt concerns an understanding of the term “ordinary conversation”. Thus, it was put into the articulations on subject vocabularies. However, this articulation on “ordinary conversation” was invoked through information on research phenomena and variables. This evidentiary excerpt provided information about a scholar’s study of ordinary conversations. It included evidence concerning how an ordinary conversation is studied (research variable) by the scholar Gaudio (2003) and a depiction (research phenomenon) of the study’s outcome. Thus, for an evidentiary excerpt such as this, it considered as evidence for inclusion in both these information practices. Evidentiary excerpts like this provided important data since they capture the complexities of information practices, and require further analysis.

4.5.2.3 Approaching the data in two dimensions

As the data were grouped into different categories, they were conceived according to the two main categories of information practices, namely literature coverage and literature use. Each literature review was concerned with both of these information practices. This may once again be exemplified by the following evidentiary excerpt:

He [Gaudio, 2003] examines the ways in which global capitalism affects conversation and claims that conversation is commodified in a capitalistic society and that ideologically free and a-historical understandings of “ordinary” or “casual” conversation are invalid. He thus writes “my aim is to demonstrate how seemingly ordinary, casual conversations are inextricably implicated in sociohistorical processes associated with global capitalism (Gaudio, 2003, p. 662)”. (J)

The analysis of this evidentiary excerpt was approached along two dimensions. When one looks at the information practices of literature coverage, the following analytic questions can be asked:

- (1) How is the selected literature relevant to the research problem concerned?
- (2) What level of coverage (topic, field, history, or other possibilities) may be found in this excerpt?
- (3) What specific type of literature coverage (breadth, topicality, etc.) is investing in this excerpt?

These questions help to probe the notion of literature coverage across all seven literature reviews. A macro level analysis of each part of these literature reviews, was applied with respect to the review of subject vocabularies and topics, research phenomena and variables, and method information. Results of these analyses were presented at the beginning of each the corresponding evidentiary chapters. The different types of literature coverage such as breadth, topicality, currency, and comprehensiveness in each literature review were accounted for. These results informed the overview of the characteristics of the PhD candidates' information practices, and also the follow-up analysis of specific excerpts for depth-understanding of literature use. The study examined the data on literature use in terms of the levels of literature synthesis; the enunciative modes in using the literature, and the concepts operating in this enunciation.

By looking at the data along both dimensions, specific forms of literature coverage and use were identified in terms of the actual information practices involved in generating a literature review. These forms were evaluated within and against the elements of literature coverage and use in the working framework. Moreover, new forms of literature coverage and use beyond this framework were also identified. In this regard, “descriptive coding” (Saldana, 2009) was the strategy used to analyse this data.

4.5.2.4 Describing the data

The working framework provided considerable detail about how the data were to be

analysed. However, it was not sufficient to naming all the data appropriately. Hence, descriptive codes were necessary to name the evidentiary excerpts (Saldana, 2009). Descriptive codes have been used to summarise what is said in an excerpt. This study has extracted descriptive codes according to what the excerpt is enacting a particular information practice and not the content of an excerpt. For example, with regard to the information practices of articulating subject vocabularies, the codes identified included “information before a term” and “information within a term”. This is demonstrated in the evidentiary excerpt below:

One way to account for this diversity [teaching approaches] is by considering the diversity of theoretical positions that researchers and teachers hold. The main traditions underpinning teaching approaches for mathematics are behaviourism, constructivism, and sociocultural theories. Kirshner (2002) reviewed the contributions of these theoretical streams to mathematics pedagogical practice and a summary is given... (S)

The literature reviewed in this evidentiary excerpt was relevant to the topic “teaching approaches”. However, it did not specify details of the various teaching approaches. Rather it focused on the presumptions that give rise to diversity in teaching. Thus, this type of information was considered “information before a term” in contrast to information about teaching approaches themselves. Descriptive codes like these were rendered into a more abstract level through memo writing, a procedure which is described below.

4.5.2.5 Memoing the data

Memo writing is a common analytic strategy in educational research (Charmaz, 2006; Saldana, 2009). Memo writing develops a code by recording the researcher’s observation, commentary, or any thought into a textual archive. Through memo writing, the researcher derived codes at a more theoretical level and identified the enunciative

modes and concepts of information practices in the PhD students' literature reviews. The example below is a part of memo relating to the analysis of the evidentiary excerpt shown in the section "Approaching the data in two dimensions":

Information understanding is revealed by the author's interpretation of Gaudio's argument. It is also warranted by Gaudio's own texts as quoted by this author. From the text above, the researcher may infer several objects of information that are enacted by the author of the thesis. In "he [Gaudio, 2003] examines the ways ... affects conversation", one may understand it as *the background information* of a particular literature. The very information was not about the phenomenon or theory that Gaudio identified and argued for. Rather, it has stated Gaudio's research topic and the important variables he may look at in his study. Thus, the background information of a study can be seen as information anterior to a term.

As to the latter part of the sentence ("claims that conversation is ... are invalid"), it is the information about the phenomenon or theory of Gaudio's study. However, to enunciate the type of information in writing a literature review, the author has took the interpreting subject who transcribed the information from the literature through her own interpretation. The given information was not Gaudio's own words, but a summary of his argument by the author herself. This also reflects the discursive object of "working understanding" (Holbrook et al., 2007) that has been discussed in prior chapters.

In contrast to the interpreted argument of one's study, the sentence "he thus writes 'my aim is to demonstrate ... global capitalism'" reflects another way of transcribing information in writing a literature review...

(May, 2014)

A memo to an excerpt does not focus on a single point of analysis. At first sight it seems a disorganised text that has covered all aspects of information practices available in this evidentiary excerpt. However, analytic memos such as this enabled the researcher to read the data beyond their face value and discern the objects, enunciation, and concepts of information practices in detail. Memo writing was applied in the analysis of all the seven literature reviews. However, it has not been possible to report each case in depth in this thesis. A selective approach has been used to report the results of the data analysis (Silverman, 2011). The more representative excerpts were chosen because they cover more themes on literature coverage or use which demonstrate the PhD candidates' information practices.

4.6 Conclusion

This chapter has explained and justified the details of the research approach employed for the study reported in this thesis. The research principles along with the processes of data collection and analysis were explained and justified. This chapter also presents a working framework which is developed based on a review of empirical studies in research education and LIS, and the theory of Foucauldian (1972) Discourse Analysis. This framework was used as a stepping stone to analyse the data. It is examined and readjusted and developed through data analysis, and is re-presented in Chapter 8. The final product, an improved analytical framework, is developed testing and developing the original through the data analysis process. The next three chapters will present the data analysis in terms of information practices on subject vocabularies, phenomena, and methods.

Chapter 5

Information Practices on Subject Vocabularies

5.0 Introduction

Chapters 5, 6 and 7 are the evidentiary chapters. Chapter 6 focuses on the analysis of information practices data under the category of articulating research phenomena and variables, that is, how Asian PhD students use information when reviewing research phenomena and variables in their literature review sections. Chapter 7 analyses the data relating to how these Asian background students embed research method and methodology information in their literature reviews. This chapter focuses on the analysis of information practices in terms of how these PhD students address subject vocabularies and topics in their literature reviews. This data analysis is in two parts: literature coverage and literature use focusing on subject vocabularies and topics in the data.

5.1 The analysis of literature coverage in the data

In the literature coverage, macro and micro level analyses are provided. Specifically, four facets of literature coverage were examined at the macro level – breadth, topicality, currency, and comprehensiveness (Bruce, 2001). At the micro level, the analysis looked into levels of coverage (Boote & Beile, 2005). These various forms of literature coverage were then reconsidered through the “topic-based” approach in Section 5.1.3.

5.1.1 Macro analysis of the data

The theory of discourse (Foucault, 1972; Radford & Radford, 2005) was used to discern the “coverage of literature” from the theses. There are statements invested in them that enable them to be in the enunciative field of information practices in higher

education (Foucault, 1972). This field of enunciation is the “surface of emergence” (Foucault, 1972, p. 45) where research students can name various objects or elements relevant to the literature coverage. Thus, according to the working framework, the data were categorised using the codes of topicality, breadth, currency, and comprehensiveness. This section examines subject vocabularies and topics under these four categories.

According to Bruce (2001), the *topicality* of literature coverage includes literature that is particularly relevant to the research topic in question. In contrast, any literature that is beyond the research topic, either within or beyond the field of the research, is considered as the *breadth* of literature coverage. *Currency* is related to the publication time of the references used in the literature review (Bruce, 2001). However, up-to-date literature which research students are expected to focus on is understood as being published less than five years before a study commences. Thus, according to the data examined, for theses by research students from Hong Kong, Singapore, Japan, and South Korea completed between 2007 and 2008, the up-to-date literatures would have been published after 1998. The current literature in studies completed by students from Taiwan (2009), Vietnam (2011) and China (2011) should have been published after 2000. Lastly, *comprehensiveness* is relatively straightforward in meaning. Research students can establish comprehensiveness by providing a table indicating the coverage of past studies of a research problem or scholars’ reviews in a research domain. These facets of literature coverage are key parameters characterising the information practices in the data analysed below. Table 5.1 provides the background information about the seven Asian doctoral students’ theses.

Table 5.1 Information about the selected PhD theses

Thesis From	Year on completion	University	Topic
China mainland (C)	2011	Monash University	Chinese Middle School Mathematics Teachers' Practices and Perspectives Viewed Through a Western Lens
Hong Kong (H)	2007	University of Western Sydney	Domain-Specificity Between Types of Peer Support and Multidimensional Self-Concept
Japan (J)	2008	University of Technology, Sydney	Performing Transculturation: Between/within "Japanese" and "Australian" language, identities and culture
Singapore (S)	2008	University of Melbourne	Problems of Teaching Mathematics in a Reformed-oriented Singapore Classroom
South Korea (K)	2008	University of Sydney	Mind and Autism Spectrum Disorders: A Theory-of-Mind Continuum Model and Typology Developed from Theory-of-Mind as Subjectively Experienced and Objectively Understood
Taiwan (T)	2009	University of Sydney	Struggles for Recognition: The Development of HIV/AIDS Curricula in Schools of Social Work in Taiwan
Vietnam (V)	2011	University of New South Wales	Confucianism and Moral Reasoning in Vietnamese Intellectually Gifted Adolescents

The initial analysis involved counting the numbers of references used in relation to subject vocabularies and topics in each literature review. The results are illustrated in Table 5.2.

Table 5.2 Data on literature coverage for subject vocabularies and topics

Data	Currency	Breadth	Topicality	Comprehensiveness
C (2011)	Up to date (2002-2007)	2	2	√
	Out of date (before 2002)	1	1	
	Total	3	3	
H (2007)	Up to date (1998-2003)	1	1	n/a
	Out of date (before 1998)	13	11	
	Total	14	12	
J (2008)	Up to date (1999-2004)	16	16	n/a
	Out of date (before 1999)	15	15	
	Total	31	31	
S (2008)	Up to date (1999-2004)	7	5	n/a
	Out of date (before 1999)	15	7	
	Total	22	12	
K (2008)	Up to date (1999-2004)	6	6	n/a
	Out of date (before 1999)	5	5	
	Total	11	11	
T (2009)	Up to date (2000-2005)	19	13	n/a
	Out of date (before 2000)	30	25	
	Total	49	38	
V (2011)	Up to date (2002-2007)	8	8	n/a
	Out of date (before 2002)	6	6	
	Total	14	14	

Table 5.2 summarises the number of works of literature within the research topic (topicality) and beyond the research topic (breadth) in each case. It also distinguishes the numbers of “new” and “old” literatures in terms of both the topicality and breadth of literature coverage to determine the degree of currency in each case. Moreover, it examines the comprehensiveness of literature coverage in the data. Each of these dimensions of the data is analysed below.

5.1.1.1 Analysis of breadth-topicality

The analysis first focuses on “breadth” and “topicality” in literature coverage. In the Chinese thesis, there are only three references relating to subject terms, and all are about “teacher perspectives” – one of the research student’s research topics. This manifests the topicality of literature coverage. Likewise, the literature included in the South Korean thesis regarding “Autism Spectrum Disorders” (ASD), also provides for topicality in the literature coverage. The subject vocabularies reviewed in these theses are within the topics of research interest indicating that the literature coverage is topicality oriented. By contrast, in other cases of the study, the subject vocabularies reviewed are not necessarily the topics of research, but are involved to support the positioning of the research projects within particular intellectual contexts. It can be seen that the other theses in the study account for an equivalent or larger portion of literature regarding breadth than topicality of coverage (Singapore: 12:10; Taiwan: 38:11; Hong Kong: 12:2; Vietnam: 14:0; Japan: 31:0). The five theses all include literature relevant to as well as supportive of their research topics. For example, in the Singaporean thesis, the research focused on geometry lessons in the context of Singaporean educational reform. This necessarily involved a review of literature on the research topic of geometric teaching and learning. However, this research topic is also situated intellectually within other supporting topics such as mathematical reasoning and teaching approaches. These supporting topics indicate the breadth of literature coverage, since they are not limited to geometry teaching and learning but are located in other areas of mathematics education.

Sometimes the breadth of the literature is greater than the topicality because of the less discernible research topic in the data. A breadth of literature coverage is required so that each supporting topic could contribute to and refine the research problem in question. This is the case with the Japanese research student who focused on examining “transculturation in communication”. Her research topic is somewhat elusive, and the research student did not use a single designation to grasp the whole idea. Thus, in her literature review, composite topics – “casual conversation” and “institutional conversation” – shed light on her research focus. This breadth of literature coverage on both types of conversations enables this research student to position her research topic in the literature.

The examination of “breadth-topicality” coverage has suggested that PhD students’ information practices on subject vocabularies and topics are more complex than the frameworks in higher education depict (Boote & Beile, 2005; Bruce, 2001). Topicality is an area of literature that particularly articulates a research topic. However, research topic can be so vague that it is difficult to distinguish topicality from breadth in these research students’ literature reviews. Some of the research students’ research topics are developed through field/s of knowledge consisting of various subject vocabularies and topics, intersecting and consensually informing an area of concern. This issue will be examined in a later analysis in this chapter. The following sub-section is concerned with the currency of literature reviews in the data.

5.1.1.2 Analysis of currency

The seven data sources show that all the research students used mixed references in terms of the numbers of the references referred to, and the age of the references. The research student from China used three references for articulating subject vocabularies in her thesis with two up to date references (published during 1999-2004) and one out of date work (published before 1999). The Hong Kong case consists of 13 old

references and only one that is up to date with current research knowledge in the field. In the Japanese thesis, 31 references were found on subject vocabularies and topics, among which 16 are up to date references and 15 are out of date. The Singaporean research student included seven up to date references and 15 references which are out of date for reviewing relevant subject terms in the study. With regard to the South Korean case, six references are up to date and five out of date in the review of ASD and relevant subject terms. The case from Taiwan comprises of 19 up to date references while 30 references are out of date in the articulation of subject vocabularies in curriculum studies. Lastly, there are eight up to date references and six out of date ones in the Vietnamese case for reviewing “giftedness” and relevant concepts.

The extent of the mixture of current versus dated literature, however, varies in the data. Four cases (Japan, South Korea, Taiwan, and Vietnam) show a mixture of literature. 50 percent of the references used by the research students were published within five years before the start of their theses. These references can be regarded as updated or new. Of course, the second 50 percent of the references are old – older than five years by their start time. Some of the old references were demonstrated to be important given that the research students reviewed the development of key concepts in the literature. This can be seen in the Vietnamese case. The research student reviewed seminal references such as the original key concept of “giftedness” and its historic development, but also reviewed contemporary understandings. This inclusion indicates that seminal references can be included in a thesis’s literature review depending on the role these references play in the field of study. In this Vietnamese thesis, its literature review includes seminal references to review the historical development of a concept that gives rise to its present appearance.

There is a degree of imbalance in the currency of the literature coverage identified in the data. More specifically, unbalanced currency was found in both the breadth and topicality of literature coverage. In the case of Hong Kong thesis on peer support, it necessarily invokes a breadth of literature on the social support domain. The review

on this topic includes definitions, specific measures, and functions of the concept “social support”. However, the literature included in this thesis is relatively outdated. Majority of the references in the literature are dated with regard to the range between 1970s and 1980s. The study thus was not informed by contemporary developments on the concept of social support nor could articulate its relations with contemporary research problem.

The Singaporean thesis demonstrates unbalanced currency with respect to the topicality of literature coverage. According to Table 5.2, the ratio between old and new references is four to one. The topic of this thesis is “geometric teaching and learning”. The term “geometrical concepts” was derived through the review of “out-of-date” literature as shown in the following evidentiary excerpt:

The term “concept” is now commonly used in the literature by researchers of diverse traditions and there is no general agreement on what it means. The author will use Fischbein’s (1993) characterization of concept as “an idea, a general, ideal representation of a class of objects, based on their common features” (p. 139). Based on this definition, geometric figures are mathematical concepts (Hershkowitz et al., 1991). [...] [T]he “mathematical concept” and “mental image” duality with which students come to conceptualise and view geometric figures has led Hershkowitz et al. (1991) and Tall (1989) to propose the idea of “concept-image” to depict one’s mental representation of a geometric figure. This construct of concept-image that highlights the strong link between the visual representation and the underlying concept is now well-used in the literature (Clement, 2001; Ouvrier-Buffet, 2006; Schwarz & Hershkowitz, 1999). (S)

This excerpt involves a review from a historical perspective of how geometrical figures are conceptualised. It uses many “old” references to review the derivation of geometrical concepts while few updated references are used. This review embraces a

large number of “old” references, and also states the impact of these references on later literature on geometry.

The examination of currency in literature coverage in the data has suggested that there is a mixed degree of “old” and “new” information relevant to subject vocabularies and topics. “Outdated” literature tends to involve the origins or historical development of a term or concept, as well as the significance of its present day influence on the field. The deviant case from Hong Kong indicates that sometimes the review of historical information is not appropriately positioned to shed light on the development of concepts or demonstrate its close relationship to the research topic. When historic literature on subject terms or concepts is reviewed, research students need to consider the relationship with current interpretations of the subject vocabularies and the research problems in question.

5.1.1.3 Analysis of comprehensiveness

Comprehensiveness focuses on the extent to which literature on a subject vocabulary or topic is reviewed. However, the exhaustive review about subject terms was not found in majority of the data. Among the data collected, only the Chinese research student demonstrated comprehensiveness in his literature when articulating the subject vocabulary and topic. To actualise comprehensiveness, he reviewed a large amount of literature on teachers’ conceptions of teaching, and further grouped these into a table providing a continuum ranging from teacher-centred to student-centred. Except for the Chinese case, the other six theses do not provide tables or other forms of meta-review to articulate the subject vocabularies or topics. It seems that demonstrating comprehensiveness by reviewing all the definitions or accounts on a subject term is not a necessary quality in literature coverage. This is consistent with Bruce’s (2001, p. 161) claim that “students need to relinquish their attempts to be comprehensive and attend instead to learning to discern significant works.”

5.1.1.4 The summary of macro-level analysis

This small-scale study cannot generalise, on a statistical basis, the patterns of information practices of Asian PhD students. Yet, it embraces a specimen perspective (Talja, 1999) that regards the data as various versions of reality which cannot provide a full picture of information practices of Asian PhD students, but can be seen as possible realities that exist in higher education. These specimens may inform supervision practices in doctoral education and expand the present discourses of information practices.

The breadth and topicality, and the ratio of out-dated and up-to-date literature in the data provide a general impression of the PhD students' information practices. However, as the data can be categorised as either subject vocabularies, research phenomena or research methods, ambiguity can appear that the patterns revealed do not accurately represent the information practices in literature coverage. Social science research normally does not contain separate sections for reporting relevant subject vocabularies, research phenomena, and methods. Rather, these are all mixed and overlapping in literature reviews. This makes it difficult to identify and categorise them with certainty. However, this complexity of literature coverage is itself a character of information practices in social science studies. This point is addressed in detail in Section 5.1.3. Further, there is difficulty categorising breadth and topicality in the data. They are sometimes melded together in the articulation of a research topic. With all these considerations, Table 5.2 merely offers a provisional understandings of the information practices in the data. Macro-level analysis indicates the orientation of literature coverage in each thesis. This overview of the data provides the groundwork upon which in-depth analysis was applied to examine the specific performances in these students' literature reviews. This micro-level analysis is presented below.

5.1.2 Micro-level analysis: Literature coverage at the field and topic levels

Micro-level analysis of literature coverage is invoked through the notions of “topicality” and “breadth”. Topicality refers to the coverage of the literature within the topic of research interest (Bruce, 2001). In contrast, breadth enacts a relatively greater coverage of literature which is beyond the particular topic of research interest, and may or may not be limited to the field of this research topic. The notion of breadth, thus, connects with connotations about the levels of literature coverage (Boote & Beile, 2005). When the coverage of literature is beyond the research topic, yet remains within the field, it can be considered as the field level of literature coverage. At this level, research students have to distinguish “what has been done in the field from what needs to be done” (Boote & Beile, 2005). Further, when the coverage of the literature is beyond the field of the research topic, it is at the topic level that research students place “the topic or problem in the broader scholarly literature” (Boote & Beile, 2005).

According to the data, a large amount of literature reviewed was at the field level, which means it was within the field of research interest. For example, in the Singaporean thesis, the research topic was geometric teaching and learning. The literature covered included “mathematics teaching”, “mathematical reasoning”, “concept-image”, “theories on mathematics teaching”, “Dynamic Geometry Software (DGS)”, and “mathematics education reforms”. These topics were not beyond the field of the research topic. They were located within the research field of “mathematics education”. Likewise, in the Hong Kong thesis, the research topic was about peer support interventions, and the literature reviewed was within the field of social support research, including “social support resources”, “supportive behaviour”, and “types of support measures”. This situation also applied in the other theses. The majority of the literature in the South Korean thesis was on autism research, in the Chinese thesis it was on teachers’ beliefs and practices, in the Japanese thesis it was on applied linguistics, in the Taiwanese thesis it was on curriculum studies, and on gifted education in the Vietnamese thesis. All seven theses included the literature from their

main research fields, while giving only a little space to literature beyond their particular research fields.

In the Taiwanese thesis however, there were indications that some of the literature reviewed was beyond the field of research. This is demonstrated by the following evidentiary excerpts.

Although social work is considered as an entity with its codes of ethics, culture and identity, it is indeed a composite professional body with diverse subgroups (Hopps & Collins, 1995, pp. 2266 & 2272). Wheeler and Gibbons (1992, p. 302) suggest that “social work should be defined as a federated profession: a group of different occupational specialties unified into one profession by a common social assignment.” The diversity leads to ongoing conflicts about curriculum development within social work education, such as debates between specialised and generalist social work training programs and arguments regarding which topics should be included in social work education (Burgess, 2004, p. 177). (*T*)

This evidentiary excerpt refers to literature which reveals both the field and topic levels of coverage. The last sentence articulates the term “social work education”, which manifests the field level of coverage (Boote & Beile, 2005). The research student’s research topic is HIV/AIDS curricula development. It connects with social work education in two ways. First, HIV/AIDS is one of the ramifications that social work focuses on by providing social support for this group of people. Second, the research student’s study was about curricula development. Then, the review of social work education can be considered a supporting topic to HIV/AIDS curricula development as both are within the educational field. Therefore, literature relating to the content of the third sentence can be seen at the field level of coverage.

The literature in the first two sentences, indicating the topic level of coverage, is slightly different from the third (Boote & Beile, 2005). There is information about “social work”, another subject term. The information regarding “social work” is an occupational view and is drawn from the area beyond the research field – education. This suggests a topic level of literature coverage since the research topic – HIV/AIDS curricula in social work education – is placed in the broader scholarly debates in the literature (Boote & Beile, 2005).

Considering the information on “social work” beyond the research field requires an in-depth examination of the information sources. At first sight, a reader may think that the information sources on “social work” define the research field, which is social work education. As the information on “social work” by Wheeler and Gibbons (1992) was published in the *Journal of Social Work Education*, it may be argued that it is not beyond the area of research. Below the information sources – Hopps and Collins (1995) and Wheeler and Gibbons (1992) – are examined more closely.

The research student’s reference list shows that Hopps and Collins (1995) chapter appeared in Edwards’ (1995) *Encyclopedia of social work (19th ed.)*. This title suggests the publication deals with wide fields of knowledge regarding social work, beyond the educational field. The title of the Hopps and Collins chapter, *Social work profession overview*, confirms it mainly concerns occupational – rather than educational – aspects of social work.

The work of Wheeler and Gibbons (1992) is in the field of education, the excerpt above does not contain Wheeler and Gibbons’ original words. Rather, they have cited Popple (1985) who gives an account for “social work” as an occupational rather than educational sense, as seen from the title and the journal – *The social work profession: A reconceptualization. Social Service Review*. Thus, through the examination of these information sources, the information on “social work” is at the topic level of coverage, which identifies a research topic in the broader scholarly field (Boote & Beile, 2005).

Virtually all the literature reviews in the data are at the field level of coverage. This means that the literature reviewed regarding subject vocabularies and topics is relevant to the topics being researched, while being located within the particular fields of research. However, the deviant case from Taiwan indicates the inclusion of literature from beyond the research field. This indicates the presence of the topic level of literature coverage in the information practices of Asian PhDs. However, considering literature coverage in terms of whether it is within or beyond a research field is itself contentious. The distinction between research field and other areas is not clearly bounded, and this distinction does not have a significant impact on the practices of literature coverage. It is more the result of literature coverage rather than the means by which literature from different areas is reviewed. Therefore, as analysis deepens on this point, the researcher argues the “topic-based” approach to consider the coverage in literature reviews. Details about this analysis are described below.

5.1.3 Reconsidering macro- and micro-level analysis on literature coverage

The topic-based approach is significant to understanding literature coverage. The coverage of literature regards the major research topic/s along with invoked sub-topics, concepts, or subject vocabularies. All of them are called “topic” in a general sense. Topics such as these are like “keys” that may be used to access literature from different areas. Continuing to refer to the above excerpt as an example, the subject term “social work education” is a supporting topic relevant to the Taiwanese research student’s research on HIV/AIDS curricula development, while it engenders other subject terms such as “social work”. Both “social work education” and “social work” are derivative topics relevant to the research topic of HIV/AIDS curricula, and enable one to access and synthesise literature in different areas. This suggests that, when creating a literature review, one may pay a particular attention to identifying subject vocabularies or supporting topics around major research topic/s since they may enable a researcher to engage with additional literature in either the field of research or other wider areas.

There are various relations between different topics found in the data. Table 5.3 below enumerates the topics, concepts, and subject vocabularies involved in each research student's research:

Table 5.3 Research topic/s and supporting topics involved in the data

Thesis	Research topic/s
	Associate topics, concepts, and subject vocabularies
C	Chinese mathematics teachers' thinking and teaching Teachers' beliefs; Conceptions of teaching
H	Peer tutoring on Self-concept Social support construct; Global social support; Relationship-specific measures of social support; Peer support intervention; Academically-oriented peer tutoring intervention; Non-academically oriented peer tutoring; Self-concept
J	Transculturation in communication Institutional talk; Informal/Casual conversation; Ordinary conversation; Everyday conversation; Small talk; Phatic communion; Trans-institutional talk
S	Geometric teaching and learning Mathematics teaching; Mathematics reasoning; Concept-image; Theoretical concepts to mathematics teaching; Dynamic Geometry Software (DGS); Mathematics education reforms
K	Autism Spectrum Disorders (ASD) Autism; Conception of ASD; ASD diagnostic criteria
T	HIV/AIDS curricula development Curriculum; Content in curriculum; Curriculum development; Hidden curriculum; Extra curricula; Social work education; Social work
V	Moral reasoning in gifted adolescents Conception of giftedness; Confucianism; Moral reasoning

Table 5.3 above shows various types of “topic-based” literature review. The first is relatively easy to discern. It means that only the literature about the research topic/s is reviewed. This is exemplified in the Chinese and South Korean theses. The Chinese case pays limited attention to reviewing relevant concepts or subject vocabularies in the literature. The research topic is about Chinese mathematics teachers’ thinking and teaching practices. Thus, the literature reviewed is particularly limited to the research topics of “teachers’ beliefs” and “conceptions of teaching”. No additional concept or subject vocabulary is introduced in the literature review. Likewise, in the South Korean thesis, the research is about Autism Spectrum Disorders (ASD), and the concepts or subject vocabularies reviewed are particularly within the research topic, namely autism, conception of ASD, and ASD diagnostic criteria.

Other theses in the data set showing the topic-based literature review are more complex and involve the review of various topics, concepts, and subject vocabularies interconnecting with the research topic/s. According to the data (theses from Hong Kong, Japan, Singapore, Taiwan and Vietnam), there are relationships between the research topic/s and the relevant concepts, topics, and subject vocabularies. It is these relationships that enable one to identify associate topics, concepts, or subject vocabularies of the research topic/s and cover the literature accordingly.

One discernible relationship between research topic/s and relevant terms is the “elemental” relationship. This is found in the Hong Kong and Taiwanese theses. In the Hong Kong case, the subject vocabularies – “academically-oriented peer tutoring intervention” and “non-academically oriented peer tutoring” – are reviewed in the literature. They form elemental relationships with the research topic of “peer tutoring”. These subject vocabularies can be seen as specific forms of peer tutoring, and are thus elements of peer tutoring. Similarly, in the Taiwanese thesis, the elemental relationship is found between the terms “curriculum” and “hidden curriculum” and “extra curricula”. Thus, literature about the sub-topics “hidden curriculum” and “extra

curricula” may be included in the review.

Second, there is a subordinate relationship between topics. It refers to a circumstance where a topic belongs to the larger topic in question. The study of peer tutoring in the Hong Kong thesis reviews the larger topic of “social support”, and the study of geometric teaching and learning in the Singaporean case reviews mathematics education in general, and which further consists of elemental topics such as “mathematics teaching” and “mathematics reasoning”; equally, the study of HIV/AIDS curricula development from Taiwan includes an upper level review on “curriculum” and “social work education”. All the larger topics are identified through the subordinate relationships.

Third, the contrastive relationship is in play. This refers to the review of contrastive topics, terms or concepts. The Japanese thesis provides evidence of this relationship. In the research on transculturation in communication, the research student reviews two contrastive terms: “casual conversation” and “institutional talk”. This suggests that the coverage of the literature may be determined when contrastive terms are identified. Also to be found in the Japanese case is a fourth relationship between topics which may be called a “parallel” relationship. In a parallel relationship, one may identify that a common topic is interpreted through the use of different terms. This is the case when the literature on “casual conversation” is reviewed. There are various terms delineating the topic of casual conversation which include “ordinary conversation”, “everyday conversation”, “small talk”, and “phatic communion”. Through these similar terms, the research student may cover and review the corresponding literature.

The fifth relationship is the “contextual” relation between topics. The contextual relationship identifies concepts or terms that in general relate to the topic in question. Data relating to this relationship are found in the Singaporean and Vietnamese theses. In the Singaporean case, theoretical concepts relating to mathematics teaching are reviewed. Concepts such as behaviourism, constructivism, and sociocultural theories

provide a theoretical context for the research student's research project. Moreover, there is a review of the topic of "mathematics education reforms", offering a general background of the research. In the Vietnamese case, the concept of Confucianism is reviewed as both the theoretical and historic contexts relevant to the research topic of "moral reasoning of Vietnamese gifted adolescents".

Regarding literature coverage as "topics-generated" reduces the nuisance of complex considerations on subjective-objective approaches to coverage (Bruce, 2001) or the levels of coverage and synthesis (Boote & Beile, 2005). However, the topic-based approach is not an avant-garde idea as to how to perceive literature reviews. There are articulations on how HDR students may develop their writing through the "concept-map" strategy (Lee & Kamler, 2008). This perhaps parallels the topic-based approach to literature reviews. However, the meta-relationships between concepts are rarely considered in the literature. According to the data, the researcher may specifically interrogate the meta-relationships between different topics in literature reviews. By being informed of the relationships between topics, one may "brainstorm" potential topics and subsequently cover potential literature relevant to a research project.

5.1.4 A short summary on literature coverage

Section 5.1 has analysed the coverage of literature on subject vocabularies and topics. Specifically, data were illustrated and analysed from two angles. On the one hand, the data were interpreted through macro-level analysis in which Bruce's (2001) approach to literature coverage was adopted. On the other hand, understanding of the data was gained through micro-level analysis in which levels of literature coverage were considered (Boote & Beile, 2005). However, by analysing the data from different angles of literature coverage, the researcher found that the actual information practices in literature coverage are rather more complex than the systems (Boote & Beile, 2005; Bruce, 2001) have suggested. Furthermore, a research topic may generate several relevant subject vocabularies, sub-topics or concepts which will enable one to access

more potential literature in different areas to articulate the research topic in question. In this sense, the researcher proposed a “topic-based” view towards the coverage of literature. It depicted various relationships between the topics, concepts or subject vocabularies. By considering these relationships, one may seek potential related topics, subject vocabularies, or concepts, and with these terms more potential information may be exposed in literature reviews. Section 5.1 has described the coverage of literature on subject vocabularies and topics, while the section ahead considers the use of literature in terms of how these subject vocabularies and topics are articulated in the literature review sections.

5.2 The analysis of literature use in the data

This section offers an analysis of “literature use” in the articulation of subject vocabularies and topics. It examines how subject vocabularies or related topics are articulated and how these are connected to the research topic/s in question. Specifically, the objects, the enunciative modes and relevant concepts as related to the information practices are examined.

In the preceding section, the evidentiary excerpt below was analysed in terms of its literature coverage, however this evidentiary excerpt may also manifest literature use in terms of the discursive objects relevant to the use of the literature, particular subject positions one may occupy to use the literature, and various concepts operating in this formulation:

Although social work is considered as an entity with its codes of ethics, culture and identity, it is indeed a composite professional body with diverse subgroups (Hopps & Collins, 1995, pp. 2266 & 2272). Wheeler and Gibbons (1992, p. 302) suggest that “social work should be defined as a federated profession: a group of different occupational specialties unified into one profession by a common social assignment.” The diversity leads

to ongoing conflicts about curriculum development within social work education, such as debates between specialised and generalist social work training programs and arguments regarding which topics should be included in social work education (Burgess, 2004, p. 177). (T)

This evidentiary excerpt appears at the very beginning of the section titled “Factors within social work” of the PhD student’s literature review. This section is one of the facets concerning “factors influencing social work curriculum development”. In this sense, this excerpt may be seen as an introductory text that generally depicts the relationship between social work and the social work curriculum. The excerpt characterises features of social work (“an entity with codes of ethics, culture and identity” and “a composite professional body with diverse subgroups”). These features define what social work is – “social work should be defined as a federated profession: a group of different occupational specialities unified into one profession by a common social assignment”. The characteristics of social work then, have determined the constitution of social work education. These include considerations within social work education, of the selection of particular social work topics or the choice between specialised and generalist social work training programs. Hence, these considerations are the things constituting the term that we may accord to as “social work education”.

5.2.1 The objects of literature use demonstrated in the data

The above evidentiary excerpt also consists of two types of information. One type of information in it can be described as “content information”, that which provides specific content about a particular topic or subject term. These types of information are used for answering questions of “what does the topic mean?” or “what is the topic about?” Within the context of the evidentiary excerpt, one may find the answers to “what does social work mean?” and “what is social work education about?” in the content information provided by the research student.

The other type of information to be found in the evidentiary excerpt can be called “contextual information”. Contextual information provides a context for a topic or subject term. In the excerpt, one may identify the information on “social work” (in the first two sentences) as providing a context for discussion of the research topic “social work education”. In a sense, the information about the features of “social work” provides a foundation, upon which “social work education” may be discussed and delimited. From this text, it can also be seen that neither of the terms “content information” nor “contextual information” is named by the nature of particular information. The information is not imbued with any particular quality that remains unchanged over time. Calling it “content” or “contextual” information rather provides information in relation to the objects to which they refer. For example, information about the subject vocabulary “social work” is content information, and when this information engages with the articulation of the research topic “social work education” becomes contextual information about the issue. The analysis above explains the general types of information that constitute a subject term or topic. Yet there are numerous kinds of information belonging to either content or contextual information. What follows below demonstrates these varieties of information in detail.

5.2.1.1 Various forms of contextual information used in the data

The first type, “contextual information”, is made up of assumptions that are relevant to a term, as demonstrated in this evidentiary excerpt:

One of the dominant stances, especially among conversation analysts, which affects the definition of casual or informal conversation is the dichotomy between casual or ordinary conversation and institutional discourse (Drew & Sorjonen, 1997; Ilie, 2001; Itakura, 2001; ten Have, 1999). (J)

This evidentiary excerpt can be seen as a presumption based on which casual conversation can be defined. This presumption is depicted as “one of the dominant stances [that] affects the definition of casual or informal conversation”. More specifically, the presumption is of a relationship between casual conversation and other terms in the field of conversation studies. The dichotomy between casual and institutional conversation is a presumption based on which the frontiers of casual conversation may be defined. Given this presumptive information, one understands that casual conversation is a term that is opposite to other conversation types, such as institutional conversation. Thus, the specific constitution of casual conversation, as one may predict, can be different from the constitution of institutional conversation. This research student of the excerpt above, however, did not provide any information on the specific content of casual or institutional conversation at this moment. The presumptive information frames the discussion that follows in the literature review, stating and problematising the meaning of casual conversation as derived from the dichotomy. Therefore, compared with information that specifies the term “casual conversation”, the presumption about casual conversation may be seen as information that is contextual to it.

Assumptions about certain terms can be also in the form of theoretical considerations. The evidentiary excerpt below is from the literature review of the Singaporean thesis:

One way to account for this diversity [the diversity in reform-oriented teaching] is by considering the diversity of theoretical positions that researchers and teachers hold. The main traditions underpinning teaching approaches for mathematics are behaviourism, constructivism, and sociocultural theories. Kirshner (2002) reviewed the contributions of these theoretical streams to mathematics pedagogical practice and a summary is given in Table 1. (S)

This evidence indicates that information about theoretical positions can be reviewed to account for diversity in teaching practice. Information of this kind may be seen as theoretical assumptions from which diverse teaching practices are derived. Hence, theoretical assumption is another group of contextual information that was found in the data.

Another form of information use can be categorised as contextual information to certain terms. This concerns historic information about a topic or subject vocabulary, as illustrated in this evidentiary excerpt:

[Social work education] was originally developed from in-service training programs for volunteers in charity organisations, and later in formal education in academic institutions (Frumkin & Lloyd, 1995, p. 2238; K. A. Kendall, 2000, pp. 8-10). Initially, social work training programs were held within organisations ... (K. A. Kendall, 2000, p. 11) ... (T)

The evidentiary excerpt above provides historical information about the topic “social work education”, addressing the social development of the topic, including where relevant practices initially emerged and how it has become a contemporary topic. As the information given by this research student is about the development of social work education, it is contextual information. Historic information can be seen not only in the social development of a topic, but also regarding the origin of a term. The excerpt below is such an example:

The term *autism* (from the Greek *autos*, “self”) was used as early as 1910 by the Swiss psychiatrist Eugen Bleuler, who also invented the term *schizophrenia*. (K)

The research student stated the origin of the term autism, which information is anterior to the term itself as it does not describe specific content of autism, but explains the

provenance of the definition. This can also be seen as a type of contextual information.

5.2.1.2 Various forms of content information in the data

Like contextual information, the data also contains information within the category of “content information”. Content information can be classified in various ways. According to the degree of abstraction, there is content information as exemplars describing a subject term, or theoretical information articulating a term; according to the development of a term, there is historical information about a term depicting its transformation through time. These types will be specified below.

First, the description of a term is accompanied by examples or metaphors. The two evidentiary excerpts below are illustrative:

A hidden curriculum can be imaged as unspoken educational practices, such as game-playing in a playground as a mechanism of socialisation for school students (Oseroff-Varnell, 1998, p. 114-117). (*T*)

The two components of mathematical reasoning – deductive and inductive – were given an interesting metaphorical illustration by Hersh (1997). Just like the front of a restaurant that shows the presentable and orderly side of the business, deductive reasoning is the formal “side” of mathematics, and, like the restaurant whose “back” is a flurry of activities and disorderliness, inductive processes are the essential “back” of mathematics. (*S*)

In the first excerpt, the research student used the first half of the sentence to describe “hidden curriculum”, and the second half to provide a specific example to help the reader to understand. In the second excerpt, the research student gave a metaphorical explanation of “mathematical reasoning”. In both excerpts the research students provided explanations of concepts, about their content or their denotative meanings.

Regarding content information that more theoretically articulates a subject vocabulary, information in the following excerpt concerns various definitions of “social support”:

Some definitions highlight the social exchanges. For example, House (1981) suggested that social support is “an interpersonal transaction involving one or more of the following: (1) emotional concern (liking, love, empathy), (2) instrumental aid (goods and services), (3) information (about the environment) or (4) appraisal (information relevant to self-evaluation” (p. 39), whereas Shumaker and Brownell (1984) conceived social support as an exchange of resources between individuals with the intent to enhance the wellbeing of the recipient. The resources proposed to be shared included: behavioural assistance, feedback, information, intimacy, and lay referrals. (*H*)

In the above excerpt, the research student described a concept “social support” without using specific examples or metaphors, rather explaining it in a more abstract sense. The following data shows that these research students also chose to provide content information in a chronological way:

In the traditional conceptualisation of giftedness, high intelligence was believed to be reflected in high academic achievements (Terman, 1925). The association between high academic achievements and giftedness was first noted at the beginning of the 20th century when tests were developed to measure intelligence (Sternberg and Davidson, 2005). (*V*)

At one time considered to be an early form of childhood schizophrenia, autism is now regarded as a developmental disorder (Wolff, 2004). Although at first it was seen as a single entity, it is now seen as a spectrum of related characteristics (Bowler, 2007). As a consequence, it is now called

Autism Spectrum Disorders (ASD). (K)

From the excerpts above, it can be seen that both research students provided historic information about the key subject terms in their research. The former text concerns the conceptualisation of giftedness. The given literature suggests that the key element of giftedness – “high academic achievement” – was defined at the beginning of the 20th century. In the latter case, the research student reviewed historic information on the term autism. Different from the former case, the information is not to trace the origin of its constituent elements, but to show the development of the concept, that is, how “autism” is conceptualised in history.

It can be seen that historic information in the data has been categorised as content and contextual information. Historical information, regardless of its category, is relevant to both the articulation of a subject vocabulary and the topic. However, the information concerns the subject term differently. That which is categorised as contextual information is usually in regard to the conditions in which a subject term may emerge. In contrast, historical information used as content information concerns the term or topic itself, that is, it is in regard to the origin or transformation of the constitution of a term or topic. Thus, the classifications of historical information between the two categories are different in relation to the articulation of subject vocabularies and topics.

So far, it can be seen that information is ordered according to its relationship with subject vocabularies and topics of research, while it is this “ordered information” – in the forms of either content or contextual information – as elements that constitutes in part the articulations of subject vocabularies/terms and research topics/focus. The objects “content” and “contextual” information are identified from the data not the working framework of information practices. However, the researcher of the study is not claiming to have identified anything new with regard to information use: “one cannot speak of anything at any time; it is not easy to say something new; it is not enough for us to open our eyes, to pay attention, or to be aware, for new objects

suddenly to light up and emerge out of the ground” (Foucault, 1972, p. 49). If the researcher of the study names various types of information as content and contextual information, it is because they are situated within a complex group of relationships. These complex relationships, in the present research context, may be partly derived from the relation between information and the subject vocabularies and research topics. By discerning the relationship as such one may name the information involved as either contextual or content information. The analysis then concerns of various enunciative modalities relevant to the use of information.

5.2.2 The enunciation of literature use

Foucault (1972, p. 81) regards that the four systems of formation (formation of objects, enunciation, concepts and strategies) “are not independent of one another [rather] there exists a vertical system of dependencies” (Foucault, 1972, p. 81). With regard to the modalities of enunciation, “[they] were described on the basis of the position occupied by the subject in relation to the domain of objects of which he is speaking” (Foucault, 1972, p. 81). In this sense, content or contextual information, although established through various modes of enunciation, authorise – either exclude or designate – certain enunciative modalities that are proper to them. Returning to the first excerpt in Section 5.2, the enunciation of the first two sentences are examined:

Although social work is considered as an entity with its codes of ethics, culture and identity, it is indeed a composite professional body with diverse subgroups (Hopps & Collins, 1995, pp. 2266 & 2272)

Wheeler and Gibbons (1992, p. 302) suggest that “social work should be defined as a federated profession: a group of different occupational specialties unified into one profession by a common social assignment.”

The two sentences above represent distinct enunciative modalities in the articulation of the subject term “social work”. For the former sentence, the research student articulated the term “social work” by adopting Hopps and Collins (1995). This information, however, is not a direct transcription from the scholars but a proximal reiteration of their original work. In contrast, the latter sentence is a direct quotation where the research student transcribed Wheeler and Gibbons’ (1992) definition of “social work” verbatim. The differences in enunciation shows two distinct subject positions that one may occupy – the interpreting of the subject for the former and transcribing for the latter. Both are typical ways that a subject term may be addressed in academic communication. In transcribing, one selects the content information about “social work” using the writers’ original words, while the interpreting position allows a certain degree of transformation in summarising and interpreting the ideas of other scholars. The attempt here is not to interrogate whether the information is accurate about the nature of “social work” or whether the information is authentically generated by these sourced scholars or it is merely the secondary reproduction from other sources but transcribed by these scholars. The concern here is how the student retains the sovereignty in their writings through the appropriate use of information. The particular modes of enunciation either by interpreting or transcribing information from the literature answer this question in part. This concern draws upon some similarities with Foucault’s (1972) depiction of the enunciation of the sentence “we have already shown that...” He says:

[The sentence] necessarily involve[s] statements of precise contextual conditions that were not implied by the preceding formulation: the position is then fixed within a domain constituted by a finite group of statements; it is localized in a series of enunciative events that must already have occurred; it is established in a demonstrative time whose earlier stages are never lost, and which do not need therefore to be begun again and repeated identically to be made present once more (a mention is enough to reactivate them in their original validity); it is determined by the prior existence of a

number of effective operations that need not have been performed by one and the same individual (he who is speaking now), but which rightfully belong to the enunciating subject ... (p. 106)

The enunciation of the two sentences, in this respect, shares some common subject positions. Both the subject positions in the sentences above may also be determined by a series of enunciative events that have already occurred prior to this enunciation. The enunciating subject, at this level, does not need to verify whether Hopps and Collins' (1995) or Wheeler and Gibbons' (1992) descriptions of "social work" are true or false. Mentioning the sources of literature, as Foucault (1972, p. 106) says, "is enough to reactivate them in their original validity". Accounts from these scholars, however, may involve several facets of information on "social work". Some information may describe the features of social work, or provide a wider context in which the term is situated. One then, in relation to the term "social work", is a subject selecting only the content information about social work from these scholars' works. Meanwhile, one is also a subject of transferring the information selected, either through interpretation or transcription, to his own writing for the term "social work". Therefore, in the enunciation of the term "social work", one is not a verifier of the preceding literature but a selector and transferrer of content information of this term. Through the occupation of these subject positions, one retains the ownership of this excerpt that "rightfully belong to the enunciating subject, which are at his disposal, and of which he may avail himself when necessary" (Foucault, 1972, p. 106).

The researcher will now focus on the third sentence in the excerpt in question:

The diversity leads to ongoing conflicts about curriculum development within social work education, such as debates between specialised and generalist social work training programs and arguments regarding which topics should be included in social work education (Burgess, 2004, p. 177).

This enunciation also requires one to occupy several subject positions. The first enunciative position involved is the interpreting subject. Like the preceding analysis suggests, this enunciative subject links with the selecting subject so that the content information on “social work education” from Burgess may be selected and transferred to his own text.

A less discernible subject position in this text is the synthesising subject which may occupy to combine different types of information. As the modalities of enunciation are based on the subject position “in relation to various domains or groups of objects” (Foucault, 1972, p. 57), they may also be based on the subject position relative to the relations established between groups of objects. The subject which connects “social work” and “social work education”, thus, is based on the relation between them. In the excerpt, this relation may be seen as contextual according to the various relations prescribed in the “topic-based” approach to literature coverage. The research student thus connected information on both terms in an order that reinforces this relation: the content information that defines the feature of “social work” may be drawn from other than the educational domain, while it has become contextual information as to the very existence and characteristics of “social work education”.

From this example, we may identify a reciprocal relationship that exists between the objects of information (subject vocabulary and research topic) and the enunciation of these objects: not only the relationship between “social work” and “social work education” determines the enunciation of the synthesising subject but also manifests and reinforces the relationship between the two terms. This reciprocal relationship thus indicates the relations that Foucault perceives between different systems of formation. As mentioned at the beginning of this section, the four systems of formation locate themselves in a vertical system of dependencies (Foucault, 1972). This implies that the modalities of enunciation are subject to the groups of objects being enunciated. This system, however, is not unidirectional, such that higher levels (formation of strategies for example) of discursive practices are dependent on lower levels of (formation of

concepts for instance) discursive practices. There are bidirectional influences between different levels of discursive practices (Foucault, 1972). The analysis of enunciation of the example above illustrates this consensual influence: without the relationship between the two objects (“social work” and “social work education”), organisation of the information may not be possible; however, it is this synthesising subject position, as occupied by the research student of the excerpt, determines the particular way of using the information for enunciating the relationships between the two objects.

From the analysis above, it is noticed that there are several different subject positions operating even in a writing with a few sentences. In relation to the topics “social work” and “social work education”, one is the subject selecting out relevant information and transferring it to his own writing through interpretation or transcription; according to the relations between the two topics, one is the subject synthesising the information speaking to these topics. A subject position is not derived by the creation of the enunciating body, but is provided by the groups of objects involved in an enunciation (Foucault, 1972). Moreover, the subject positions do not speak to the objects in an arbitrary way. The transferring subject does not transfer all the information on “social work” to his writing, nor does the synthesising subject combine the two objects in question in a random order. Rather, the selecting and transferring subject reproduces information according to the degree of relevance; and the synthesising subject articulates the relationships of objects to certain extents of coherence. These modalities of enunciation thus imply several concepts that are in operation in academic discourse. The section below will elaborate further the concepts relevant to the articulation of subject vocabularies in literature reviews.

5.2.3 The concepts of information practices

Literature coverage and use are supported by concepts in the form of statements formulating a field of enunciation. Thus, any formulation or series of signs is situated in an enunciative field “in which it has a place and a status, which arranges for its

possible relations with the past, and which opens up for it a possible future” (Foucault, 1972, p. 111). By analysing literature coverage and use in the articulation of subject vocabularies and topics, the study has identified several concepts in the information practices of literature reviews. Some concepts can be exemplified in the excerpt in Section 5.2:

Although social work is considered as an entity with its codes of ethics, culture and identity, it is indeed a composite professional body with diverse subgroups (Hopps & Collins, 1995, pp. 2266 & 2272). Wheeler and Gibbons (1992, p. 302) suggest that “social work should be defined as a federated profession: a group of different occupational specialties unified into one profession by a common social assignment.” The diversity leads to ongoing conflicts about curriculum development within social work education, such as debates between specialised and generalist social work training programs and arguments regarding which topics should be included in social work education (Burgess, 2004, p. 177). (*T*)

This evidentiary excerpt refers to the terms “social work education” and “social work”. The former is a major topic closely relating to the Taiwanese research student’s research on HIV/AIDS curricula development, and the latter is a derivative subject term. What is presented to the readers is the two terms being linked in a relevant and coherent order through rhetorical devices and the information speaking to them. Relationships such as relevance and coherence are surrounded by a group of statements forming “a field of coexistences, effects of series and succession, a distribution of functions and roles” (Foucault, 1972, p. 112).

Taking the concept “relevance” for example, there are both subjective and objective articulations about relevance in academic discourse. These articulations constitute the field of presence (Foucault, 1972) where various formulations of relevance may be enunciated. Relevance in a subjective sense is a user-perspective in which one

establishes the relationship between certain information and the research in question (Bruce, 2001). In contrast, the objective view to relevance considers it as a relationship indispensable between groups of information or between information and a study (Bruce, 2001). The relationship between information on “social work” and “social work education” resonates this objective view of relevance. The terms “social work education” and “social work” have literal connections through the words “social work”. Thus, the objective relationship can be discerned without much difficulty. However, this relation needs to be rendered further to see its specific function in the formulation.

This relevant relationship, however, requires further elaboration through another important relationship in literature reviews – coherence. From the evidentiary excerpt in question, the rationalisation of relations between the two terms can be discerned: the features of social work, to certain degree, determine the appearance of social work education. It is not to interrogate the truth of rationalisation nor does he examine the source of this rationalisation, whether it derives from the scholars of the literature or the research student’s own accounts. The researcher nonetheless argues that this organisation of information gives rise to a degree of coherence in literature reviews.

The formulation of this coherent relationship is also subject to the enunciative field. This relationship on the one hand forms a discursive relationship with relevance. It can be seen as the subsequent possibility of statements on relevance, “which may follow the statement as its consequence, its natural successor, or its conversational retort (an order does not open up the same enunciative possibilities as the propositions of an axiomatic or the beginning of a narrative)” (Foucault, 1972, p. 111). The coherent and relevant relationships intersect at this point that coherence is the succussive formulation of relevance in this excerpt concerned. On the other hand, the formulation of this coherent relation also cannot escape “the field of presence” about coherence. Coherence in academic discourse generally concerns of two dimensions – “ability to select literature and position it in a way that advances an argument; and misuse or underuse of references in support of the argument” (Holbrook et al., 2007, p. 345-346).

Coherence examined in this excerpt (written by the Taiwanese research student) refers to how information on “social work” may be synthesised to account for the research on “social work education”. It refers to the former point of coherence. Information on “social work” is selected and positioned as the contextual information based upon which there give rise to the various practices of “social work education”.

The analysis of this excerpt has identified major concepts of relevance and coherence and the relationship between them. However, this evidentiary excerpt cannot significantly reflect some other concepts which are also relevant to the information practices of literature reviews. Hence, the evidentiary excerpts to be examined below will shed light on concepts such as “criticality”, “scholarship is a conversation”, and “creativity” in both research education and LIS. The following excerpt demonstrates the concepts “criticality” and “scholarship is a conversation”:

Even though Schegloff defines ordinary conversation as a type of conversation which is free from hierarchical and institutional inferences (Schegloff, 1999, p. 565), he at the same time takes up the ambiguous distinction or the fluidity between institutional and ordinary talk in his later work ... (*J*)

First, there are various ways manifesting the concept of criticality. Boote and Beile (2005) and Holbrook et al. (2007) conceptualise criticality in terms of distinguishing ambiguities or appraising the literature reviewed. As to the review of subject vocabularies, the degree of critical performance is categorised as “key vocabulary not discussed; key vocabulary defined; and discussed and resolved ambiguities in definitions” (Boote & Beile, 2005, p. 8). Hence, we may perceive that the subject term “ordinary or casual conversation” is fully discussed in the research student’s literature review, wherein the dichotomy between them was noted. This dichotomy is a basis on which casual and institutional conversation can be defined and differentiated. Nevertheless, the ambiguity of this dichotomy is discussed in other selected literature

which disagrees with the former that considers a sharp distinction between casual and institutional conversation. The excerpt above is an example which notes this ambiguity in emphasising “the fluidity between institutional and ordinary talk”.

In the discourse of LIS, the threshold concept “scholarship is a conversation” can be seen as counterpart with the concept of “criticality” in research education. This concept, according to ACRL (2014), concerns a sustained discourse on a research issue in academia. There is not only one perspective on or interpretation of a problem, as there are always “new insights and discoveries occurring over time” (p. 8). The research student’s discussion on the definition of “casual conversation” offers a good example of this concept. The research student first discussed the distinction between casual and institutional conversation. This distinction is a perspective based on which casual conversation is defined. However, the understanding of casual conversation does not end at this level in academic conversation. Hence, the remaining part of the literature is a review of viewpoints *contra* the dichotomy between casual and institutional discourse. This presentation of different perspectives on a subject vocabulary rightly indicates that scholarship is a conversation rather than the retrieval of a correct answer that suffices once and for all.

Another important concept in Asian PhD students’ literature reviews is “creativity”. This can be seen in the excerpt below:

For this study, the type of conversation in question is not defined as either structural or functional. [...] This implies that a definition of “trans-institutional talk” in its own terms is required. [...] Trans-institutional talk refers to any conversation which falls outside a conversation dealing with a pragmatic business transaction and is the mental, spatial and temporal “third place/space” which goes beyond not only the dichotomous institutional versus casual frame of activities, but also goes beyond the temporal and spatial constraints... (J)

Creativity is a concept characterising a higher level of literature review. In Boote and Beile's (2005) literature review rubric, it suggests creativity in terms of "synthesised and gained a new perspective on the literature" (p. 8). Likewise, creativity is also manifested in the term "disciplinary perspective" (Holbrook et al., 2007) which indicates "a genuine grasp of theory, and the candidate's ever-present awareness of the literature and evidence of engagement with it, particularly in producing a project that does make a significant and original contribution to the field" (p. 349). The term "trans-institutional talk" in the excerpt is a reflection of this concept since it denotes a "disciplinary perspective" generated from reviewing various types of conversation in the literature.

This excerpt is also situated in a complex enunciative web in which discursive relations between concepts can be found. Creativity in this excerpt enacts interrelationships with other concepts such as relevance, coherence, and criticality. First of all, creativity may be seen as an extension of the concepts of coherence and relevance. Generating a new perspective on a definition, research method or significance indicates the research student's depth of understanding of the literature on a particular issue. This solid knowledge of the literature pertaining to a research problem is a pivotal part in the concept of coherence. Coherence is stated as the "ability to select literature and position it in a way that advances an argument" (Holbrook et al., 2007, p. 345). Creativity rightly manifests the subsequent consequence (Foucault, 1972) of coherence in which the reviewed literature generates a new perspective in relation to the study concerned. This may be found in these particular sentences from the excerpt above:

For this study, the type of conversation in question is not defined as either structural or functional. [...] This implies that a definition of "trans-institutional talk" in its own terms is required. (*J*)

The research student previously reviewed various definitions of “conversation”, while various types of conversation did not appropriately fit her study. To modulate the coherence between the literature reviewed and the study, the term “trans-institutional talk” with its composite inclusion of various types of conversation was adopted. In this sense, this modified coherence was actualised by creativity in which a new term was created to “cohere” with the study concerned. Similarly, the connection between creativity and relevance can also be identified from the description of “disciplinary perspective” – a key indicator of creativity. Generating a new perspective indicates in-depth immersion of the literature and the engagement with the research project. This suggests that the development of a creative perspective is, to a certain extent, determined by a profound level of relevance between the information and the research. The literature on various definitions of “conversation” are relevant to the research student’s research topic, and provides a basis on which creativity may be realised.

Besides the relationship between creativity and the two concepts, there is also a connection between creativity and criticality, which may be found in statements regarding synthesis of the literature. In the generation of a new perspective, the statements are thus ordered: “accepted literature at face value; some critique of literature; and offered new perspective” (Boote & Beile, 2005, p. 8). Likewise, statements on methodology are also ordered in an ascending degree of creative performance: “research methods not discussed; some discussion of research methods used; critiqued research methods; and introduced new methods to address problems” (Boote & Beile, 2005, p. 8). The orderings of statements suggest that there is a form of dependence (Foucault, 1972) between the concepts of criticality and creativity. It seems that generating a new perspective needs to be based on one’s critique of the previously collected literature. With regard to the present excerpt, the new term “trans-institutional talk”, as containing new perspectives to the understanding of conversation, is the result of the critical discernment and evaluation of former definitions of conversation in the literature.

So far, the study has analysed the modalities of existence of the concepts involved in information practices. It can be seen that the enunciation of concepts, such as relevance, coherence, criticality, or creativity, is located in an enunciative field where concepts as groups of statements coexist in various discursive relationships. These relationships formulate the enunciative web in which

[T]here is no statement in general, no free, neutral, independent statement; but a statement always belongs to a series or a whole, always plays a role among other statements, deriving support from them and distinguishing itself from them: it is always part of a network of statements, in which it has a role, however minimal it may be, to play (Foucault, 1972, p. 111).

Hence, any concept of information practices does not stand alone in characterising the writing of a literature review. Rather, it forms various relationships with other concepts. The analysis in this section does not exhaust all possible relationships between these concepts. However, uncovering these discursive relationships is significant to the understanding of writing a literature review. Research students' information practices in literature reviews are caught in this enunciative web of these discursive concepts.

5.3 Conclusion of the chapter

This chapter has analysed and discussed the information practices on subject vocabularies and topics. It first addressed literature coverage. The practices are interpreted through two systems of literature coverage (Boote & Beile, 2005; Bruce, 2001). Both systems can be used to understand the Asian doctoral students' coverage of literature. However, they may not capture the complexity and nuances of the information practices on literature coverage. It therefore entails an alternative interpretation which the researcher has proposed the "topic-based" approach to perceive literature coverage. The topic-based view to literature coverage specifies various relations between research topics and sub-topics, subject vocabularies, and

concepts. These relations enable one to locate relevant topics or terms through which potential literature may be covered. With regard to the dimension of literature use, the researcher examined the objects involved, the enunciative modes invoked, and the concepts invested in the articulations of subject vocabularies and topics. Literature use in articulating subject vocabularies and topics involves the operation of various objects of information that may be classified as content or contextual information. Then, in relation to the various objects of information, one may occupy different enunciative positions in literature use. One such position can be a role of transferring literature, through interpreting or transcribing information into the research in question; another may be the synthesising subject that connects subject vocabularies and research topic/s into a coherent whole. Lastly, the researcher has drawn on the concepts of information practices. The concepts identified in higher education (research education and LIS) discourses are invested in the information practices of Asian doctoral students' literature reviews. Moreover, the concepts do not independently operate in the articulation of subject vocabularies and research topics. They confer with and support each other and form an enunciative web in which various information practices may be caught. The next two chapters will report the analysis and discussion of information practices on research phenomena and methods.

Chapter 6

Information Practices on Phenomena and Variables

6.0 Introduction

Chapter 5 focused on the analysis of information practices on subject vocabularies and topics in the data. This chapter analyses how the Asian students conducted their information practices when they reviewed phenomena and variables relevant to the research problem in their literature reviews. Specifically, this analysis remains in the two areas of literature coverage and literature use. Analysing the coverage of literature includes macro and micro levels of examination, and the analysis of information use investigates the objects involved in phenomena and variables, various modes for enunciating phenomena and variables, and the concepts underpinning the particular objects and enunciation.

6.1 The analysis of literature coverage in the data

Different from the literature concerned with subject vocabularies and/or topics, the literature on phenomena and variables includes the phenomena that past studies have identified on a research problem. A research problem often involves various aspects to be considered; phenomena in past studies often focused on particular variables relevant to a research problem. Hence, this section looks at the coverage of phenomena and variables in the literature data, and Section 6.2 investigates the data on the aspect of literature use.

6.1.1 Macro-level analysis of literature coverage

Like the preceding chapter, the researcher first examines the four aspects – breadth, topicality, currency, and comprehensiveness, at the macro-level of analysis. The

results of the data are illustrated in Table 6.1.

Table 6.1 Data on literature coverage for phenomena and variables

Data	Currency	Breadth	Topicality	Comprehensiveness
C	Up to date	19	8	n/a
	Out of date	20	9	
	Total	39	17	
H	Up to date	13	9	√
	Out of date	21	13	
	Total	34	22	
J	Up to date	1	1	n/a
	Out of date	2	1	
	Total	3	2	
S	Up to date	19	8	n/a
	Out of date	20	9	
	Total	39	17	
K	Up to date	10	10	√
	Out of date	9	9	
	Total	19	19	
T	Up to date	18	6	n/a
	Out of date	26	15	
	Total	44	21	
V	Up to date	5	5	√
	Out of date	26	9	
	Total	31	9	

6.1.1.1 Analysis of breadth-topicality

According to Table 6.1, the information on phenomena and variables indicates both the breadth and topicality of literature coverage. The literature about phenomena and variables is reviewed not only on the topic of the research but also areas beyond the topic. This is similar to the patterns of literature coverage on subject vocabularies and topics where both breadth and topicality of literature coverage can be found. However, there are differences to be found in the coverage of phenomena and variables from that

of subject vocabularies and topics.

Although the amount of literature on breadth remains as high as the coverage on subject vocabularies and topics (see Table 5.2), there is a significant rising amount of literature on topicality compared with a lesser amount on subject vocabularies and topics (Table 5.2). This indicates more literature within the research topic is engaged, when reviewing research phenomena and variables. This is the case in the theses of China, Hong Kong, Singapore, Taiwan, and Vietnam. There is a comparable number of references on topicality as on breadth. The Taiwan thesis is a typical example of this change. The ratio between breadth and topicality in the literature on subject vocabularies and topics is 38 to 11 (see Table 5.2), while in the literature on phenomena and variables it is 21 to 23, even slightly over on topicality. Specifically, the topicality of literature in the Taiwan thesis includes the review of stigmatised topics (HIV and AIDS) along with their curricula. In a sense, the phenomena of perspectives on stigmatised topics in society and the status of their curricula are reviewed. With regard to the breadth of literature, phenomena on the development of general curriculum and extra or hidden curricula are reviewed.

The examination of breadth-topicality in these Asian PhD students' theses implies the trend of their information practices. Literature coverage on research phenomena and variables is both breadth and topicality oriented. It is not as though the scope of literature on subject vocabularies and topics that more information is found that is beyond a research topic. This is because, perhaps, a research topic usually is caught in a net of various concepts or terms in a wider field of knowledge. However, with the articulation of phenomena and variables, one may identify more studies relevant to a particular research topic. This does not mean the literature of phenomena in wider areas is peripheralised. The data indicate that there is literature belonging to breadth of scope under research phenomena and variables. The question is how the breadth of the literature is positioned in relation to the research problem. This will be analysed in later sections of this chapter.

6.1.1.2 Analysis of currency

The currency of scope in the data demonstrates a mixture of “old” and “new” literature. This is not a surprising result as reviewing the literature on phenomena and variables necessarily involves information from different times. However, the overall orientation identified in the data is that a significant number of references referred to are relatively outdated. Only half of the cases (China, Singapore, and South Korea) may maintain a roughly 50 percent ratio of updated and outdated literature, while there is not a single case where there is significantly over 50 percent of updated literature on phenomena and variables. Specifically, this is the situation with both the breadth and topicality of scope. All the theses examined tend to include less updated information (e.g. within five years) on the breadth of coverage. For example, the research topic in the Hong Kong case is about peer support, but has also reviewed phenomena about social support in general:

In the past, social support research has put much effort into examining the effect of global perceptions of social support. The overall social network, its size and density were thus commonly examined. However, social support research has increasingly focused on assessing the support provided by particular supportive figures, and examining the relation between these more specific measures and psychological wellbeing. Some of the findings have compared the effect on wellbeing of various sources of social support. For example, Grissett and Norvell (1992) found that non-bulimic women perceived greater support in their lives, from both family and friends, than bulimic women. In work settings, Russell, Altmaier, and Van Velzen (1987) found that support provided by one’s supervisor could reduce job burnout among teachers but support given by co-workers, friends, and one’s spouse did not. (*H*)

This paragraph includes a review of the research focus in social support research. It states the general transformation of the research focus from overall social networks to specific supportive figures and measures. This perspective, however, may not be properly supported by the exemplars. The literature provided is relatively outdated, and may not demonstrate a clear transition in social support research. Likewise, there is a similar problem on currency in the topicality of scope. Although there is a mix of old and new literature articulating phenomena on a research topic, the majority of the literature is not updated. The thesis from Vietnam exemplifies this. In the Vietnamese case, there is information particularly describing gifted students' moral reasoning – the research topic of the study. However, most of the literature included is six years old, or older. Considering the year (2011) of completion of the thesis, it appears that literature on the moral reasoning of gifted students in the new century is missing from the review. Thus, the lack of updated information may not inform a general picture on the field of study.

The issue of currency on information of phenomena and variables suggests less updated literature be included with caution. This argument, however, is itself subject to further debate in higher education. On the one hand, if including outdated literature is problematic, it may inform the supervisors and other participants in higher education to assist research students considering more effective strategies for literature coverage. This can result in teaching more effective search strategies in LIS for retaining more updated literature and/or prompting PhD students in research education to constantly update literature in relation to the research problem examined. On the other hand, some may consider the inclusion of outdated literature as less problematic. The question then is how outdated literature may be justified as significant to a particular research problem.

6.1.1.3 Analysis of comprehensiveness

The comprehensiveness of scope is also considered. There are three cases (Hong Kong,

South Korea, and Vietnam) applying a comprehensive review of literature on research phenomena and variables. This suggests more comprehensive reviews are made on phenomena and variables than on reviewing subject vocabularies and topics, where only one case (China) considers this. This might be because there are numerous studies focusing on interpretations of a research phenomenon, and few on re-defining or re-conceptualising a term or concept. Although there are more comprehensive reviews found on phenomenon than on subject terms, it does not suggest that comprehensiveness of scope has priority over significance (Bruce, 2001). Rather, the comprehensive review of literature is problematic in relation to research. In the Vietnamese thesis, numerous studies on Confucianism are included. However, there is neither an evaluation of these studies which weighs the significance of each of them, nor is there an articulation of a positioning statement regarding how the research is informed by these studies. Comprehensive review of literature does not establish connections as such. Rather, due to the limited space in a literature review section, comprehensiveness impairs the in-depth review of literature and gives rise to both synthesised and genuine perspectives on a research problem. This analysis provides a discussion on the degree of comprehensiveness in a literature review in doctoral education.

6.1.2 Micro-level analysis of literature coverage

Micro-level analysis refers to the analysis of how the phenomena and variables provided in the literature are related to the field, topic, and historic levels of coverage. There are also considerations of the forms of coverage belonging to either the subjective or objective approaches. This section analyses literature coverage in three representative excerpts from the data, which will be analysed in terms of their literature coverage. This does not mean the analysis of these excerpts exhausts all possibilities of which the literature coverage on research phenomena and variables is composed.

Excerpt 1:

Researchers (Brown & Cooney, 1982; Cooney, 1985; Richardson, 1996) asserted that teachers' beliefs about mathematics and mathematics teaching underlie their practices—the methods they choose to use for promoting their students' learning in the classroom. Ball (1991) and Ernest (1989a) suggested that, to a large extent, differences found in teachers' work depend on their views of teaching and learning of mathematics. Similarly, Cross (2009) noted that how a teacher conceptualises the nature of mathematics has direct impact on his or her teaching. (C)

Excerpt 2:

While certain studies showed that there is no necessary relationship between morality and intelligence (Brooks, 1985; Gath, Tennenth & Pidduck, 1970), most research indicates that the gifted are presumed to have a privileged position in the maturation of moral thinking because of their precocious intellectual growth (Andreani & Pagnin, 1993). (V)

Excerpt 3:

Although few people question the need to use visual representations to help students build concept-images and to solve problems, some researchers have cautioned against their indiscriminate use in geometry teaching. Mesquita (1998) saw the use of diagrams as supporting intuitive approaches to geometry. However, she cautioned that over-reliance on diagrams can stunt students' progression beyond figure-based reasoning to more formal geometric reasoning. Re-interpreted through the van Hiele levels theory, Mesquita's concern was that students' purely visual-based learning could prevent their progression beyond the first level of geometric thinking. (S)

6.1.2.1 Field and historical coverage in the phenomena and variables

With regard to the different levels of coverage in reviewing research phenomena and variables, there are a large number of references belonging to the field and historic levels of coverage in these Asian doctoral students' literature reviews. This means literature included for reviewing research phenomena and variables is not beyond the particular field of research. Rather, it appears within a research field and is ordered in a sense of its historic development. This characteristic seems straightforward given that if one study is located in a particular field one does not need to look at phenomena in other areas that have been researched. Thus, exploring the description and interpretation of the phenomena in the particular field of interest are perhaps sufficient to understand the field with which one is involved. Moreover, reviewing the information on a particular field of research necessarily involves looking at the historic development of the research in that area. This may invoke literature coverage at the historic level. The analysis of currency at the macro-level has demonstrated this point. Literature reviews of phenomena and variables often begin with less updated information to demonstrate a relatively complete picture of the development of a research problem.

Specifically, in Excerpt 1, the literature covered is about the influence of teachers' beliefs upon their work, while the group of teachers being examined in these studies cannot be distinguished by disciplines. They are teachers from mathematics only – the very discipline in which the research student was interested. In Excerpt 2, the literature reviewed is about the phenomenon of the relationship between morality and intelligence. Since one part of the research student's thesis is to concern the moral development of gifted students, it seems plausible to review the information on this particular phenomenon. The literature in Excerpt 3 remains at the field level of coverage, but is different from the other two excerpts. In Excerpt 3, the literature (Mesquita, 1998 and van Hiele, 1986) included is all located in the field of geometry teaching and learning, however, it is concerned about different research problems

within this field. Literature from Mesquita (1998) is about the effect of visual representations in geometric learning, while van Hiele's (1986) research topic is on geometric thinking itself which is hierarchised into different levels. Comparing with Excerpt 3, the literature in Excerpts 1 and 2 is not only from the same field but also concerns the same topic in the particular field. In a sense, the literature in Excerpt 1 is all from the field of pedagogic research and focuses on the topic of mathematics teachers' thinking in terms of its influence on their work. Likewise, the literature in Excerpt 2 is from the field of gifted education as regards the topic of moral development in gifted students.

So far, the analysis has been informed of the feature of Asian doctoral students' literature coverage relevant to the review of research phenomena and variables. They tended to focus on the field level of coverage. However, there is a degree of variation between cases. Some may cover the literature of different historical times. This suggests that a literature review is enacting both the field and historical levels of coverage. Uncovering the levels of literature scope on phenomena and variables partially demonstrates the information practices of Asian PhD students. The different levels of literature coverage as in the articulation of research phenomena and variables imply the specific forms of coverage being suggested by Bruce (2001). The following section focuses on an analysis of different forms of coverage in these excerpts.

6.1.2.2 Subjective and objective approaches to coverage

The following analysis examines some forms of coverage specifically in the three excerpts above. The first form of coverage that can be immediately perceived is topicality. This is made clear in the above analysis. Topicality concerns the literature coverage within the topic area of the research (Bruce, 2001), thus it aligns with the field level of synthesis. It is particularly evident in Excerpts 1 and 2 that literature included for review is around a single research topic.

Different from the Excerpts 1 and 2, the literature in Excerpt 3 indicates another form of coverage – breadth. According to Bruce (2001), breadth is manifested when particular studies are beyond the research topic but relevant to the research. A research topic is established not exclusively by a particular strand of literature. It often enacts a wider body of literature within and/or beyond a research field. This breadth of literature coverage is found in Excerpt 3 where different aspects on geometrical teaching and learning are reviewed. This excerpt not only includes the literature on the effects of visual representation on geometric learning (Mesquita, 1998), but also the study on geometric thinking (van Hiele, 1986). Both studies are located in the field of geometry education, while their different foci towards geometry suggest the breadth of literature coverage. This breadth of coverage is perhaps more significant than topicality to the review of research phenomena and variables. It shows the readers of interests a wider picture where the research student's research is located. Bruce (2001) is also in favour of breadth over topicality. It is considered appropriate to the literature review process since it diverts one to unduly immerse in the topic area of research and demonstrates a fuller grasp of the literature supporting a research project.

The examination of the three excerpts above also suggests another form of literature coverage – exclusion. Exclusion is “the need to exclude a particular range of information” (Bruce, 2001, p. 162). What has been presented in the three excerpts is the selection of particular range of literature and the exclusion of other information sources. As mentioned in the former section, the literature in Excerpt 1 is in regard to mathematics teachers' beliefs upon their work, thus excluding the beliefs of teachers from other disciplines. Excerpt 2 is from a study on gifted students' moral development, therefore literature on the moral development of other groups of subjects is excluded. Likewise, the literature in Excerpt 3 is from the field of geometric teaching and learning, while literature on general pedagogy or other disciplinary pedagogies is excluded. This analysis does not suggest that the excluded literature has not emerged in other parts of those theses. Rather, it particularly focuses upon these excerpts. This inclusion and exclusion of particular literature implies a process of selecting

information more or less valued and relevant to the research topics. This may prompt one to consider the degree of aptness of the selected literature to the research problem. The finding of the analysis may also inform the supervision practices in research education. Supervisors may ask research students to reflect on their literature coverage practices by asking why it is that this particular literature appears in the texts rather than something else. The next section discusses literature use in the statement of research phenomena and variables in these theses.

6.2 The analysis of literature use

The data demonstrates three aspects of the use of information relating to research phenomena and variables: the objects involved in the phenomena and variables, the modes of enunciation, and the concepts operating in the information practices. As earlier stated, analysis at the micro-level aims to demonstrate various information practices existing in the data rather than exhaust all the information practices in literature review. The analysis is to provide insight for HDR students and their supervisors in higher education by drawing on various possibilities for information practices.

6.2.1 The objects involved in phenomena and variables

Literature use on the articulation of research phenomena and variables will first be investigated regarding the objects and elements involved. There are various types of phenomena found in the data. According to the level of abstraction, phenomena can be categorised as empirical phenomena, metaphorised phenomena, and theorised phenomena. To begin, the excerpt below may exemplify empirical phenomena:

She [Lampert (1990)] noted that, too often, mathematics in the classroom is seen by students as a set of unchallenged facts and rules handed down by an authority to be remembered and applied. (S)

Empirical phenomena are obvious in the case above. The information describes students' perceptions of mathematics learning in the classroom. This description may be seen as a phenomenon empirically derived from Lampert's (1990) observation of mathematics learning. Within this particular sentence, there is no further elaboration of the phenomenon either by generating abstract terms or metaphors or engaging it with advanced theories. Thus, what this information says is a phenomenon in the empirical sense. Compared with empirical phenomena, metaphorised phenomena render an empirical fact with metaphors to make a generalisation. This may be demonstrated in a literature review this way:

... [S]he (Yackel, 2002) advocated a proactive role for teachers in guiding mathematical discourses and even in explicating the argumentative basis for claims that students make. This view of teachers assuming an essential role in classroom mathematical reasoning resonates with the metaphor of teaching as managing intellectual fermentation used by Ball and Chazan (1999). Although teachers cannot directly control students' learning, they can be catalytic in stirring and directing the fermentation process in classroom mathematical reasoning. (*S*)

This text describes the phenomenon where teachers take a proactive role in the reasoning processes of mathematics. This phenomenon is then metaphorised as "managing intellectual fermentation". This metaphorisation thus reproduces what can be called "metaphorised phenomena". In addition to these two types of phenomena, there is also the description of phenomena through a theoretical lens. This may be called "theorised phenomenon" as in the following example:

Eggins and Slade (1997) claim that the function of casual conversation is to maintain, construct and negotiate social reality and social identities. (*J*)

The excerpt above describes the function of casual conversation. However, it does not depict the specificity of the function of casual conversation (this information appears elsewhere in the research student's literature review), neither does it interpret the phenomenon through the use of metaphors. Rather, this phenomenon is generalised in a theoretical sense. One may not perceive a concrete picture of "social reality" or "social identities" in relation to "the function of casual conversation". Thus, this phenomenon of information reaches a higher level of abstraction.

The examples above demonstrate various types of phenomena that were involved in these Asian PhD students' literature reviews. They may constitute "grids of specification" (Foucault, 1972) in which various modes of phenomena can be identified. In addition to the different modes by which phenomena can be classified, phenomena may be further broken down into various variables.

The synthesis of variables is also mentioned in Boote and Beile's (2005) rubric of literature reviews. It suggests that the variable is an important object in literature reviews and often discussed in literature review practices. However, the object "variable" has not been fully specified in academic discourse. From the data examined, the researcher may derive some specifications about variables. The excerpt below may suggest variables appearing in past studies:

It has been suggested that it is important to consider both the source and type of support when examining the association of social support with wellbeing of adolescents (see review by Cauce, Reid, Landesman & Gonzales, 1990) since there is differential impact on certain outcomes due to particular supportive functions given by different supportive figures. (*H*)

The information reviewed in this excerpt is to examine "the association of social support with wellbeing of adolescents". In other words, it studies the influence of social support on adolescents' wellbeing. However, the text does not to demonstrate a

general phenomenon of social support on wellbeing of adolescents. Rather, the information proposes some variables that may have an effect on outcomes of social support. Hence, the “source” and “type” of support are variables of concern here. They are like elements of a research event, and each breeds specific studies. The variables of concern distribute the study of social support effects within their particular dimensions. In this sense, there is a group of references used in dealing with this part of reviews in the data. Some may review variables around a research topic. This has been demonstrated in the excerpt above. The excerpt below exemplifies another situation in reviewing the variables of information:

Teachers and students from different cultural backgrounds hold different views about teaching, learning, and what is important in education, which might cause differences in their motives, approaches, performance, and learning outcomes (Biggs, 1996). Watkins (2000) and Zhu, Valcke, and Schellens (2008) proposed that cultural variables such as philosophical perspectives, value orientations, and motivation greatly impact students’ learning and how they and their teachers conceive of learning. (C)

This excerpt demonstrates a review of a single variable on a research topic – teaching and learning outcomes. This research topic may be approached in several ways. One may be concerned with variables such as pedagogy, teachers’ thinking, or students’ thinking, and literature on these variables can be found accordingly. Within the particular example in question, the variable under review is none of the variables exemplified nor a combination of them. It reviews the cultural effect as a single variable as to teaching and learning outcomes. Moreover, this excerpt indicates another feature in reviewing a single variable of information. The text addresses teaching and learning outcomes by approaching the effect of the cultural variable. However, even in this single variable, there are sub-variables such as “philosophical perspectives”, “value orientations”, and “motivation”. These sub-variables may all be perceived as cultural variables and each unfolds a particular field of literature. According to the

above two excerpts, there is a variety of variables relevant to a topic. Within the repertoire of the literature, one may either select a group of variables or a single variable of information to review a topic.

The analysis above concerns types of phenomena and variables. All of them are important objects that are relevant to information use in literature reviews. In other words, such information use necessarily involves the construction of various types of phenomena and diverse organisations of variables. The following section analyses specifically the various modes of enunciation relevant to these objects.

6.2.2 The enunciation of literature phenomena and variables

This section focuses on the analysis of various modes of enunciation found in the data, particularly in the PhD students' information practices on articulating research phenomena and variables. Hence, the three excerpts used to analyse literature coverage are displayed below again for the reader's convenience:

Excerpt 1:

Researchers (Brown & Cooney, 1982; Cooney, 1985; Richardson, 1996) asserted that teachers' beliefs about mathematics and mathematics teaching underlie their practices—the methods they choose to use for promoting their students' learning in the classroom. Ball (1991) and Ernest (1989a) suggested that, to a large extent, differences found in teachers' work depend on their views of teaching and learning of mathematics. Similarly, Cross (2009) noted that how a teacher conceptualises the nature of mathematics has direct impact on his or her teaching. (C)

Excerpt 2:

While certain studies showed that there is no necessary relationship between morality and intelligence (Brooks, 1985; Gath, Tennenth &

Pidduck, 1970), most research indicates that the gifted are presumed to have a privileged position in the maturation of moral thinking because of their precocious intellectual growth (Andreani & Pagnin, 1993). (V)

Excerpt 3:

Although few people question the need to use visual representations to help students build concept-images and to solve problems, some researchers have cautioned against their indiscriminate use in geometry teaching. Mesquita (1998) saw the use of diagrams as supporting intuitive approaches to geometry. However, she cautioned that over-reliance on diagrams can stunt students' progression beyond figure-based reasoning to more formal geometric reasoning. Re-interpreted through the van Hiele levels theory, Mesquita's concern was that students' purely visual-based learning could prevent their progression beyond the first level of geometric thinking. (S)

6.2.2.1 The interpreting subject position

First of all, like the review of subject vocabularies and topics, the review of research phenomena and variables also involves the interpreting subject. This subject position enables one to transfer information from literature to his own text, while allowing a degree of transformation in words of the original literature. Basically, this subject position appears in all of the three excerpts with variation. In Excerpts 1 and 3, several sentences involve original source scholars. These scholars are placed in the subject position of each sentence. Yet, it is noted that the subject of a statement does not refer to the subject of a sentence in the grammatical sense (Foucault, 1972). Even though the information in these sentences is derived from these scholars, they do not give rise to the formulation of these sentences. To make the enunciation possible, one has to occupy the interpreting subject position of which, in relation to the phenomenon in question, summarises and interprets needed information from the literature. In Excerpt

2, the grammatical subject positions are occupied not by personal nouns but by words like “certain studies” and “most research”. That there is no personal noun in the subject position does not lead to the claim that the subject of the statement is absent, nor does it attribute the subject to the writer of this text (The research student). According to Foucault (1972), the subject of a statement is not “the cause, origin, or starting-point of the phenomenon of the written or spoken articulation of a sentence; nor is it that meaningful intention which, silently anticipating words, orders them like the visible body of its intuition” (p. 107). In other words, the subject of a statement is not a psychological subjectivity. Rather, “it is a particular, vacant place that may in fact be filled by different individuals” (p. 107). Hence, the formulations of these texts are not made by the original authors of the literature used nor creatively generated by the writers of these students’ theses. It first of all involves one filling in a vacant enunciative place. As in the cases above, this vacant place is the interpreting subject position which one occupies.

6.2.2.2 Synthesising subject position

Articulating information on research phenomena and variables also involves other subject positions. The synthesising subject is another significant position which is omnipresent in the enunciative modalities of information use. Analysis of these excerpts shows various manifestations of this subject position. The synthesising position is revealed according to the relations between different information sources. Excerpt 1 demonstrates a relatively simple organisation of phenomena. Information in each sentence reports a particular phenomenon. The distinct phenomena in these studies, however, formulate a certain level of consistency. All of them concern mathematics teachers’ work in relation to their perceptions of teaching and learning. They consistently conclude that there is a direct impact by teachers’ thinking on their teaching practices. Thus, what presents to the reader is that similar information from different sources is invariantly synthesised. This excerpt suggests the existence of the synthesising subject who connects information even in a most straightforward manner.

The other two examples are more complex. Their formulations are still relevant to the synthesising subject, but they conjure up other enunciative positions.

Excerpt 2 consists of two sentences, both of which concern the relationship between morality and intelligence. The articulation of this phenomenon generates two different conclusions. Information in the former sentence considers that there is no significant relationship between the two elements. In contrast, information in the latter sentence claims that intellectual growth has an impact on moral development. The information in the two sentences gives rise to contradictory descriptions of the phenomenon being examined. Although they are opposing views towards a phenomenon, the connection of the contradictory information sources also indicates the synthesising subject in operation. In this sense, the synthesising subject functions not only to integrate information that consistently describes a phenomenon, but also links contradictory information about a phenomenon. The synthesis of contradictory groups of information, however, is not possible without further elaboration of this synthesising subject. The synthesising position in Excerpt 2 displays a different functionality from the one in the preceding paragraph.

The synthesising subject is not to merely illustrate individual and similar studies. Rather, by synthesising the different studies, one derives a contrasting group of information. This synthesis can be done not only with the synthesising subject, but also with the research student to enact the comparing and contrasting roles. The comparing and contrasting subjects enables one to differentiate sources of information in a synthesis. Yet, as this analysis proceeded at this point, I began to notice that the synthesising subject may always complement the comparing and contrasting roles. The comparing and contrasting subject positions are operating not only in the enunciation of Excerpt 2 but also in Excerpt 1. When the research student of Excerpt 1 demonstrates a group of similar studies, s/he has already taken the comparing and contrasting roles. Thus, a refutation of my former understanding must be clarified: information synthesis not only involves one to occupy the synthesising subject position

but also at least the comparing and contrasting subject roles. The group of subject positions co-effect the enunciation of synthesis in which a group of information may be ordered either in parallel or contrastive forms.

The examination of Excerpt 3 gives rise to more implications on the modalities of enunciating phenomena in literature reviews. The information in this excerpt concerns the effects upon geometry learning from using visual representations. This phenomenon is interpreted through two types of information. One is the empirical information about this phenomenon, viz., “over-reliance on diagrams can stunt students’ progression beyond figure-based reasoning to more formal geometric reasoning” Mesquita (1998). This empirical phenomenon is engaged with information at a more theoretical level. The van Hiele Levels Theory is used to reinterpret this phenomenon. Hence, it has been transformed as a “theorised phenomenon”, which term the researcher has described in the former section. Through examination of this excerpt, what first appears is a combination of two different information sources. Thus, the synthesising subject, as seen in many situations of information synthesis, is necessarily invoked in this enunciative mode.

This subject position, however, is not sufficient to account for the enunciation of this excerpt. A more specific subject role is operating. This is the reflecting subject role that one may enact in enunciations as Excerpt 3. This subject position can be identified through analysing the excerpt in detail and comparing it with the other two excerpts. In the first two excerpts, the researcher examined the relationships within the information about phenomena. Hence, from Excerpt 1, the different information sources produce a consistent description on the phenomenon concerned. In Excerpt 2, the two distinct groups of information generate controversial understandings of a phenomenon. Although the depictions of a phenomenon in the two examples either conform or disagree with one another, the phenomenon explained using different sources remains at the same level. The information about the phenomena in both cases is empirical, and none of it is beyond this level of description. Since the groups of

information used are at the same level, they are comparable in that their consistency and differences in the articulation of a particular phenomenon may be determined. The information on the phenomenon in Excerpt 3 is not from the same level, and differs from the other two excerpts. Mesquita (1998) empirically interprets the phenomenon in question, while information from van Hiele is more theoretical and can be applied to different situations. In this sense, information from different levels is perhaps less comparable, while the relationships between them are more reflexive. Hence, the synthesis of different levels of information of a phenomenon involves one occupying the reflecting subject position, from which one reflects on a phenomenon in terms of its epistemological or ontological underpinnings.

Moreover, this reflecting subject position can be rendered further through the sentence in Excerpt 3: “Re-interpreted through the van Hiele levels theory, Mesquita’s concern was that students’ purely visual-based learning could prevent their progression beyond the first level of geometric thinking”. This sentence states that Mesquita is concerned about the prevention of visual-based learning on progressing through the levels of geometric thinking. However, by examining the references from Mesquita’s paper, we can be certain that this is not what she said. Rather, the connection between Mesquita’s work and van Hiele’s theory is made by the research student of Excerpt 3. Nevertheless, even if this is the research student’s articulation “on behalf of Mesquita”, it cannot be completely attributed to the research student’s psychological subjectivity. The subject of the statement remains as this reflecting subject who can discover the relation between the groups of information (Foucault, 1972). The relation between the literature as such “is not linked with synthesizing operations of a purely psychological kind (the intention of the research student, the form of his mind, the rigour of his thought, the themes that obsess him, the project that traverses his existence and gives it meaning)” (Foucault, 1972, pp. 59-60). Rather, it is the result of one’s dispersion in various enunciative modalities (Foucault, 1972; Frohmann, 1994). The reflective subject position is perhaps one such enunciative modality. The analysis above may not exhaust all the subject positions which are derived from various statuses, sites, and

positions a PhD student has endorsed in discursive practice. For one to speak of anything at any time, conditions are necessary. That is:

[t]he historical conditions required if one is to “say anything” about it, and if several people are to say different things about it, the conditions necessary if it is to exist in relation to other objects, if it is to establish with them relations of resemblance, proximity, distance, difference, transformation. (Foucault, 1972, p. 49)

It is not easy to say something new, like new relation within literature. One is always subject to many and imposing conditions and taking over the subject positions assigned by these conditions (Foucault, 1972; Gunneng, 2006; Kendall & Wickham, 1999; Willig & Stainton-Rogers, 2008). The subject positions analysed in the excerpts – interpreting subject, synthesising subject, comparing and contrasting subject, and reflecting subject – may not exhaust all the information practices relevant to phenomena and variables. However, they exemplify how one reviews research phenomena and variables in applying the literature included. This draws on implications for novice researchers who may consider these subject positions when writing literature reviews.

6.2.3 The concepts operating in the literature on phenomena and variables

Like the concepts involved in the articulation of subject vocabularies and topics, there are also several concepts operating in the literature on phenomena and variables. These concepts, as derived from the discourses of research education and LIS, are unfolded in terms of their specific performance on this aspect of information practices.

6.2.3.1 Concept of relevance

The concept of “relevance” is theorised based on the data. Like its operation on subject

vocabularies and research topics, relevance performs similar functions in the enunciation of phenomena and variables. This concept has been examined in the case on subject vocabularies and research topics. Likewise, this form of relevance is manifested in the present cases. In Excerpt 1, the three sentences are relevant to each other in that the information they contain is based on a common research focus. All of the studies involved in this excerpt concern the effect of teachers' beliefs about their work. Moreover, the research student indicated that all of the studies concern an issue in the field of mathematics teaching. This can be seen in phrases such as "mathematics and mathematics teaching (in sentence one)", "teaching and learning of mathematics (in sentence two)", and "the nature of mathematics (in sentence three)". The relevance between the groups of information is self-evident. The research student did not need to render the relationship any further since the relevance between them has followed a certain rule of autonomy that the simple addition of the information is enough to illuminate the relevant relations. Similarly, the information in Excerpt 2 also formulates this form of relevance. Even though the two sentences in Excerpt 2 comprise mutually exclusive information, they are relevant on the basis of the common issue being discussed. The information in both sentences is about the phenomenon of the relationship between morality and intelligence. By identifying this common issue, the relevance between the pieces of information can be seen without further elaboration. The text may still be considered as a constitution of information that is objectively related.

Compared with the first two excerpts, relevance in Excerpt 3 is relatively difficult to perceive. Information from Mesquita and van Hiele is not about the same issue. Mesquita studies the effect of visual representation on geometry learning, while van Hiele concerns students' development of geometric thinking. Moreover, the studies of Mesquita and van Hiele belong to different levels of research endeavour. Mesquita's study takes into account some empirical research results – particularly on visual representation – while van Hiele proposes to generate a substantial theory that may account for geometric thinking in general and be applicable in various situations

of geometry teaching and learning. Hence, they are neither concerned about the same thing nor the same extent of abstraction on the things observed. In this sense, relevance between them is perhaps less discernible. Relevance is established through one's occupying of the enunciative subject's position (the reflecting subject is the enunciative position in the case examined, and this has been analysed in the above section). These subject positions enable one to build and rationalise relevance between information pieces that are not closely related at first sight. Through the practice of a particular subject position, information of relevance is sometimes considered as "subjectively formulated" by individuals in contrast with relevance in the sense of objectivity. This distinction between subjective and objective thus breeds two forms of relevance that are dispersed in the discursive practices of information use.

6.2.3.2 Concept of coherence

The concept of "coherence", as mentioned, includes selecting and positioning literature in an argument and the accurate use of references in a text (Holbrook, 2007). The analysis of this concept in the enunciation of subject vocabularies and research topics concerns the coherent use of information in relation to the research being conducted. In this sense, coherence is similar to the concept of relevance since both of them attempt to find relationships between the information included and the study concerned. Yet, coherence can be seen as a specific form of relevance. Through the concept of relevance, we may perceive relevant relations between the information and research, while it is the concept of coherence that renders the specific organisation between them. This is an organisation within which the collected information may cohere with the research in question. Thus, like the operation of coherence in the enunciation of subject terms and research topics, this is also manifested in the enunciation of phenomena and variables. To examine this concept as imbued with these excerpts, the researcher needs to contextualise them within their corresponding research. Through examining these relations built with these PhD students' respective studies, a few forms of coherence are identified.

First, coherence is built into the justification of the research focus. Taking Excerpt 1 as an example, the information, as we know, is about the effects of mathematics teachers' beliefs on their teaching practice. Then, how the information plays a role in the thesis as a whole is a question that may imply coherence. This question may be addressed when looking at this text in the thesis contextually. Firstly, the aim of the research student's research is to: "identify typical ways in which the participating Chinese mathematics teachers carried out their teaching; and examine how these teachers' perspectives are linked to their observed practices". According to this research aim, one understands that this study is to examine Chinese mathematics teachers' teaching activities as well as their perspective upon those practices. In this sense, the teachers' perspective is one of the research focuses in the research student's study. Information in Excerpt 1 is used as a justification of the research focus. The information indicates the importance of teachers' thoughts on teaching practices. Thus, with information of this kind, one justifies the necessity of looking at teachers' thoughts on the study of teaching and learning. This is even more evident in the concluding sentences following this excerpt: "to better understand why and how mathematics teacher education can promote pedagogical improvements, teachers' views must be addressed. [...] this study focused in part on teachers' epistemological stances about what constitutes mathematical knowing and how one might learn mathematics as a root for how they create learning opportunities for their students". This conclusion may be summarised as a justification the researching of teachers' views as pertinent to pedagogical improvements. This justification is rightly derived from reviewing the literature as the excerpt indicates. Hence, coherence can be found when information is used for justifying a research focus.

Second, coherence is also manifested in the generation of research hypotheses. In Excerpt 2, the information regards a debate on whether there is more advanced moral development in gifted people than in their non-gifted counterparts. Tracking this excerpt in the literature review, the research student reviewed more information

relevant to this field of knowledge. These reviews finally give rise to a conclusion that “it is argued that as the cognitive developments of gifted students are higher than their age-peers, their moral reasoning is anticipated to be at more advanced level.” In this sense, a hypothesis was derived that gifted students are more advanced in moral reasoning than non-gifted students. In actuality, this is one of the research hypotheses that the research student attempted to tackle. The research student generated several research hypotheses while the derivation of each is from the review of information in terms of theories and past studies. This is evident in the leading sentence of the chapter “research questions and hypotheses”: “[...] the arguments and the hypotheses generated from theoretical frameworks and previous studies are presented”. This case suggests another form of coherence functions in positioning hypotheses in research.

Thirdly, coherence is found in use in the designing of research. Excerpt 3 concerns the appropriate use of visual representations in teaching and learning geometry. The information in this particular text does not state its relation to the research. However, following the information on visual representations is a summary section reporting its relevance to the study. Coherence between the reviewed information and the study can be seen in this section. First, the research student considered the use of the van Hiele levels theory. The information on theory “guides the design of the geometry curriculum that is used in this project; the need to take students’ van Hiele level into consideration when carrying out instruction is taken as a given”. Second, information on using visual representations is also considered in the design of the research: “pedagogical applications (such as the use of a suitable range of examples to illustrate a geometrical concept) are incorporated into the preparation and planning of the teaching materials used in this study.” The summary clearly indicates the coherent relationship between the information reviewed and the design of the research.

By examining these excerpts, the researcher recognises the operation of the concept of coherence in these Asian students’ literature reviews. Different from the analysis of concepts on subject vocabularies and research topics, the present analysis does not

focus on the discursive relations between coherence and relevance, nor does it pay attention to the presence of these concepts in academic discourse. After all, these analytic tasks have been dealt with in Chapter 5. The present analysis expended effort on the manifestations of these concepts in literature reviews. The examples demonstrate that information included for review connects with the research in several ways. Sometimes the information justifies a particular research focus, and sometimes it helps the research student of the thesis to generalise research hypotheses; while in other situations, it guides the design of the research process. These circumstances are believed to be too numerous to itemise in these examples. Yet, it is within these various relations between the information and the research that the concept of coherence is present and operational. Seeking manifestations of concepts in literature reviews does not end up only with relevance and coherence. In addition to these two concepts mentioned so far, there are others in the data analysis such as “criticality”, “creativity”, and “scholarly conversation”. The next section unravels these concepts in detail.

6.2.3.3 Other concepts

These other concepts present themselves in the fields of research education and LIS. They include “criticality”, and “creativity”, as well as threshold concepts in LIS such as “scholarship is a conversation”. The analysis of them involves further examination on the three previously chosen excerpts above.

First, the uses of “criticality” and “scholarship is a conversation” will be examined in Excerpt 2. The concept “criticality” refers to either the critical appraisal in terms of information and information sources (ACRL, 2001; Holbrook, 2007), or the distinction of ambiguities on subject vocabulary, phenomena or variables (Boote & Beile, 2005). As to the concept “scholarship is a conversation”, it refers to “the idea of sustained discourse within a community of scholars or thinkers, with new insights and discoveries occurring over time as a result of competing perspectives and interpretations” (ACRL, 2014, p. 8). Information in Excerpt 2 has shown two distinct

perspectives on the relation between morality and intelligence. This can be seen as a form of criticality since the ambiguity on the issue has been noted. Moreover, according to “scholarship is a conversation”, the group of information engages in a sustained debate in the field of research on the moral development of gifted people. Therefore, although there is no further elaboration of this ambiguity and a new perspective is yet emerging, one may still trace the operation of criticality in this formulation.

The use of “creativity” is examined in Excerpt 3. Research on literature reviews by Holbrook et al. (2007), and Boote and Beile (2005) showed that they consider creativity in terms of new perspectives and research methods. A new perspective, as called “disciplinary perspective” (Holbrook et al., 2007), is derived from one’s immersion in the literature of interest. As to new research method, it can be generated from the review of past studies in terms of their research methods used (Boote & Beile, 2005). When a new research method is proposed, it may contribute to a particular field of research where orthodox research method remains dominant. With regard to the excerpt under investigation, however, creativity is neither manifested in terms of developing a new disciplinary perspective nor in proposing a new research method.

The subjective creation of the connection between different information sources is another form of creativity to be examined. In Excerpt 3, a review of information from Mesquita (1998) and van Hiele (1986) and the synthesis of them imply a different form of creativity. We know there is no immediate relevance between Mesquita’s and van Hiele’s research, and the connection between them may be attributable to the research student occupying the reflecting subject’s position. By interpreting Mesquita’s work through the lens of van Hiele’s levels theory, the research student created a new angle for perceiving Mesquita’s study on geometric learning. This implies that a new perspective on one’s information may be derived once the information is interpreted by conferring it with other information sources.

The generation of a new perspective, nonetheless, must be distinguished from the objective synthesis of the relevant literature. The fresh interpretation of Mesquita's work from the research student is a subjective derivation. It is not the case, like the Excerpts 1 and 2, that relationships between information sources are manifest and can be objectively discerned. Rather, the view towards Mesquita's work is subjectively angled and created through engagement with other information such as the van Hiele levels theory. Moreover, the new perspective on one's study also needs to be distinguished from the "disciplinary perspective" (Holbrooke et al., 2007). Previously noted is that disciplinary perspective is retained through one's immersion in a collection of literature in a particular research field. As to the present form of creativity, a perspective on a discipline or a research field is yet to be produced. It is rather a perspective generated towards a particular scholar's work. Hence, the type of new perspective is different from Holbrook's (2007) term "disciplinary perspective", yet it is adjacent to it. Both concern generating a perspective on the literature reviewed, and both may be seen as specific forms subject to the concept of "creativity".

6.3 Conclusion of the chapter

This chapter has analysed various information practices on the articulation of research phenomena and variables. It is concerned with two dimensions – literature coverage and use. In literature coverage, the researcher has examined data at the macro- and micro-levels. The macro-level analysis informed a general view of literature coverage on phenomena and variables. Patterns of breadth, topicality, currency, and comprehensiveness of coverage were examined. At the micro-level of analysis, literature coverage in specific excerpts from the data was investigated. Through these levels of analysis, patterns of the levels of literature coverage were identified. Moreover, specific practices on the breadth and topicality of coverage were revealed and other forms of coverage such as exclusion identified. Regarding the dimension of literature use, the data has indicated various types of phenomena and variables according to the levels of abstraction. They may be considered as the objects or

elements one may involve when reviewing the literature in this respect. According to these objects or elements, various enunciative modalities may be seen. These modalities are actualised when one occupies various subjects' positions in the information practices. Lastly, several concepts in both research education and LIS were examined. Particularly, concepts of "relevance", "coherence", "criticality", "creativity", and "scholarship is a conversation" were demonstrated in terms of how they characterise the information practices relevant to the review of research phenomena and variables. For all the things being analysed in this chapter, they are manifesting the possible information practices in Asian PhD students' literature reviews. These possibilities in turn may inform supervisory practices and expand existing statements on information practices in higher education. The next chapter will analyse the review of method-related information.

Chapter 7

Information Practices on Method-Related Information

7.0 Introduction

In Chapters 5 and 6, the researcher analysed literature coverage and use relevant to the reviews of subject vocabularies and research phenomena. The present chapter focuses on an analysis of how these Asian PhD candidates utilise information in reviewing research methods in their literature sections. Reviews of research methods in the methodology chapters of PhD theses normally cover the general research design for the project, specific data collection and analysis techniques, and the principles the researcher follows throughout. However, from the data of the seven students, information related to research methods was also found in their literature reviews. This chapter analyses the method-related information practices. It first provides an overview of method information in the data through a macro-level analysis. A three-level analysis follows, namely the explorations of discursive objects relevant to method information, the enunciative modes describing how one articulates these objects in a literature review, and the concepts in research education and LIS that are operating in the enunciation of these objects and modalities (Foucault, 1972).

7.1 A general analysis of method information in the data

This section presents an overview of the data on reviewing method-related information. Two categories – “method information engaged” and “method information reviewed” – are considered in this macro-level analysis. “Method information engaged” refers to the information that is engaged through research students’ evaluation and/or integration of the information in a whole project context. In contrast, “Method information reviewed” refers to the information merely stated in the literature, but for which there is no further articulation or comment from the research students. Data

from analysis of the seven PhD theses' literature reviews which fall within these two categories are shown in Table 7.1 below:

Table 7.1 Method information in the data

Data	Method information engaged	Method information reviewed
C	10	9
H	8	36
J	n/a	n/a
S	7	7
K	n/a	n/a
T	5	2
V	3	15

Method-related information has been found in five theses (China, Hong Kong, Singapore, Taiwan, and Vietnam), while the cases from Japan and South Korea are not available in the present analysis of method information. The literature reviewed in both cases was mostly about concepts relevant to research problems, and little text mentioning or engaging with method information. According to Table 7.1, numbers shown under each category refer to the number of times it appears in the data. However, these numbers are not an accurate reflection of each category, a classifying a block of text into certain categories is always elusive. These numbers are only pointers suggesting the orientation of information practices on method information in the data.

The categories – “method information engaged” and “method information reviewed” – are for consideration of the general ways of using method information in literature reviews. Examples of these two categories are provided below. First, this is an excerpt which belongs to “method information engaged”:

How Confucianism plays the role in shaping the psychosocial development of these gifted students in Vietnam is an important question that needs to

be addressed in this study. It is expected that gifted and non-gifted Vietnamese students, with a wide range of coping strategies, experience differences in their endorsement of Confucianism, a philosophy surrounding their up-bringing environments. (*V*)

This excerpt articulates one of the questions the research student attempted to address – “How Confucianism plays the role in shaping the psychosocial development of these gifted students in Vietnam...” This research question is invoked through a review of literature on Confucianism. Moreover, it also articulates a hypothesis of the research (See the last sentence in this excerpt). This research hypothesis is also derived from reviewing Confucianism research. In this sense, method information of past studies is engaged with the formulations of the research question and hypothesis. Therefore, the researcher classifies the information into the group of “method information engaged”. In the following excerpt, “method information reviewed” is exemplified:

Goodenow (1993) investigated the effect of classroom belonging and support on two motivation variables (expectancy of success and intrinsic value) in a sample of 353 sixth- through eighth-grade middle school students. (*H*)

This excerpt is a block of information that belongs to “method information reviewed”. The information in this excerpt states the research focus and the sample size of a study. Specifically, it is informed that the research from Goodenow (1993) is to investigate the effect of classroom belonging and support on the expectancy of success and intrinsic value among 353 sixth- through eighth-grade middle school students. However, there is no further comment on this block of information. Neither is there an evaluation of this study itself nor is there any comment of its implications to the research student’s research project. Hence, information as such is categorised as “method information reviewed”.

Overall, the data suggest that each case is comprised of both the method information reviewed and engaged. There is a proportion of the method information reviewed accompanying the review of subject vocabulary or research phenomena; and there are also some articulations about the method information itself. In the cases from China, Singapore, and Taiwan, there are a few places appearing as both method information engaged and reviewed. In the Chinese case the researcher identifies 10 occurrences of “method information engaged” and nine of “method information reviewed”. In the Singaporean case there are seven occurrences in each of the two categories. With regard to the case from Taiwan, there are five occurrences of “method information engaged” and only two belonging to the “method information reviewed”. Method information that appeared in the Vietnamese case is different. There are only three occurrences in the literature review chapter engaging with method information, while the majority of the method information is reviewed in the methodology chapter. The Hong Kong candidate includes the most method information in his literature review. There are a total of 36 places showing method information reviewed. However, only eight of these were evaluated by the research student. Although these cases demonstrate variations of the method information, all of them indicate that there are few places indicating the “method information engaged”. These elementary findings require further elaboration to identify the characteristics of the two categories in depth. Several types of method information are identified in both categories, and are analysed below.

7.2 Discursive objects relevant to method information

In this section, Foucault’s (1972) accounts on the discursive formation of objects informed the exploration and identification of the objects relevant to method information. Specifically, method information can be classified such as “research focus”, “research method/design”, “research context”, “research process”, and “research result”. The categories “method information reviewed” and “method information engaged” can be found in each of these objects.

7.2.1 Method information relating to research focus

The first type of method information is “research focus”. It refers to aspects of a research problem that may be addressed in a study. This, however, needs to be distinguished from information on “research variable” as analysed in Chapter 6. These may overlap in literature review data since both are concerned with how a study addresses a research problem from a particular angle. Yet, they provide the reader with different types of information. Information considered as “research variable” often reports the “findings” about a “research focus”. This may be exemplified as the following excerpt shows:

Levitt, Guacci-Franco, and Levitt (1994) showed that perceived social support was related to several academic indicators for adolescent students, including grades and standardised achievement test scores. (*H*)

This excerpt demonstrates a research variable being considered by this Hong Kong research student. The research student reported Levitt and his/her colleagues’ study on the relationship between social support and adolescent students’ academic performance. The relation itself can be considered as a research focus. It is not a study of the effects of social support on students’ behavioural rectification, nor is it on mental health. Rather, it is a research focus about the effects of social support on academic achievement. Unlike the articulation of “research focus”, “research variable” provides more information about this focus. The excerpt indicates it does not merely state the focus of Levitt and his/her colleagues’ research. It demonstrates a fuller picture of this focus by confirming that social support is related to academic performance on specific aspects including “grades and standardised achievement test scores”. In this sense, “research variable” reports specifically the findings of a research focus.

Research focus exclusively discusses what aspects of the research problem have been addressed in the past studies. Information about research focus is the most prevalent kind of method information in the data. However, there is variation in the data with respect to this type of method information. Some method information is merely reviewed, and other information is engaged to position a research project. The following excerpt is an example illustrating the category “method information reviewed” with regard to research focus:

In addition, Lipschitz-Elhawi and Itzhaky (2005) examined the relation between the provision of resources and the adjustment of 112 adolescents.
(H)

In this excerpt, the research focus – the relation between support resources and the adjustment of adolescents – is reviewed. It states what the scholars’ (Lipschitz-Elhawi & Itzhaky, 2005) study is about within the field of social support research. However, there is no further comment on this research focus. It is thus considered to be “method information reviewed”. The researcher identifies similar information in other cases. This may be exemplified as follows:

As CA [conversation analysis] scholars, Schegloff and Drew are not interested in how context and location determine the structure of conversation but rather in how participants orient and constitute themselves and the institutional context by means of structuring conversation. (J)

The excerpt above is another instance where information on research focus is reviewed. The information in this excerpt is about institutional conversation consisting of two research focuses. In specific, research on institutional conversation may be proceeded upon either as “how context and location determine the structure of conversation” or “how participants orient and constitute themselves and the institutional context by means of structuring conversation”. The research focuses then indicate the two general

research orientations in this field, while again there is no further comment on this particular information.

In contrast with this information, the “method information engaged” can be exemplified in the excerpts to follow. There are different ways research focus is engaged in these Asian PhD students’ theses. The excerpt below shows that research focuses from different literature are evaluated:

Some scholars suggest that current understandings in k-12 curriculum studies can be applied to consideration of curriculum in higher education and that it is unnecessary to develop separate explanations (Tierney, 1995 [1989], pp. 36-37). Like their more junior counterparts, tertiary education institutions have to deal with basic questions in curriculum design, such as, “what subjects should be taught?” or “why should these subjects be taught” (Burgan, 2006, p. 49) (*T*)

This excerpt is concerned with whether and how understandings in k-12 curriculum studies may be transferred into the context of higher education curriculum studies. As such, common research questions between the two areas of study are set out. They may be considered as the research focuses that both k-12 and higher education curriculum studies may share. From this excerpt, research focuses in k-12 curriculum studies are not simply reviewed. Rather, they are evaluated in terms of their possibilities of transferring into higher education curriculum studies. This example demonstrates one of the information practices with which the research focus is engaged. Research focuses may be evaluated for their transferability between different strands of research. Another way of showing the engagement with research focus is found in the excerpt below:

As Confucianism is part of Vietnamese culture, it is important to recognise that such philosophy imposes a great impact on gifted students in Vietnam.

How Confucianism plays the role in shaping the psychosocial development of these gifted students in Vietnam is an important question that needs to be addressed in this study. (V)

This excerpt has been demonstrated in Section 7.1 to indicate the identification of the method information engaged. More specifically, it shows that the research focus is engaged with the PhD student's research project. The literature reviewed by this research student suggests that there is an impact from Confucianism on Vietnamese gifted students. This information is considered to be the research focus of the research student's study. It is engaged with her/his research through this comment: "How Confucianism plays the role in shaping the psychosocial development of these gifted students in Vietnam is an important question that needs to be addressed to in this study". This excerpt indicates that not only the research focus can be evaluated within the literature, but it can be linked with one's research project. Both ways suggest the research focus is engaged rather than merely reviewed in the literature review.

This study does not argue that all the research focuses in literature reviews need to be engaged as the two preceding excerpts have shown. However, it needs to be concerned with the degree of engagement with research focuses. Research focuses cannot merely be reviewed in the literature. Their evaluation and connection with the research project can be perhaps more succinctly demonstrate the purpose and significance of reviewing the method information. After the analysis of "research focus", the researcher then looks at other objects relevant to the two categories in the data. The following discussion is about "research method/design", which is another group of method information.

7.2.2 Method information relating to research design

Method information relating to research method/design was found in the data. Some information of the type is reviewed and some is engaged. The following excerpt is an

example of the “method information reviewed”:

A few studies have adopted longitudinal research designs to examine the maintenance effect of peer tutoring. For example, Greenwood, Delquadri, and Hall (1989) conducted a longitudinal investigation. (*H*)

This excerpt states “longitudinal research” design was used in the past studies to examine the maintenance effect of peer tutoring. However, there is no further comment from the research student concerning of this type of design. It is expected to know how this research method affects the interpretation of the research result (Boote & Beile, 2005) or how it can apply to research students’ research projects in terms of positioning appropriate research methods for their studies. Information as such demonstrates the review of method information, while there is less engagement identified. In contrast, according to the data, there are some examples manifesting research students’ engagement with methods:

The benefits of these peer support interventions have been reported. For example, Naylor and Cowie (1999) conducted a large-scale survey ... Wassef, Mason, Collins, VanHaalen, and Ingham (1998) conducted a peer support intervention ... However, research critically analysing the impact of diverse peer support interventions has often been plagued with theoretical and methodological flaws. (*H*)

This excerpt first refers to some studies on peer support interventions. Then, there is an evaluation of these studies in the last sentence. This evaluation indicates the research student’s engagement. More specifically, the methods are evaluated, in terms of their theoretical and methodological flaws, as having an impact on the research result of diverse peer support interventions. Although this sentence manifests the engagement of methods, the evaluation is insufficient. There is no further information regarding how the theoretical and methodological flaws may influence the studies on

peer support interventions. This sentence suggests that reviewing and evaluating research method/design are of necessity in literature review. Boote and Beile (2005, p. 4) argue that “it should not only report the claims made in the existing literature but also examine critically the research methods used to better understand whether the claims are warranted”. Engaging with the information on research method/design may foster a better understanding of the claims made in the literature.

Another way engaging with information about methods is found in the following excerpt:

A challenging problem in studying teachers’ conceptions and their instructional practices is that only some elements of this endeavour, such as teachers’ actions and language, are observable. The views that underlie teachers’ overt behaviours are implicit and may be hard to access and infer. ... Moreover, as Fang (1996) and Thompson (1992) cautioned, there may be wide inconsistencies between professed beliefs (what teachers say) and classroom practices (what teachers do). In this regard, Thompson (1992) raised a conceptual and methodological issue: How may one examine teachers’ thinking in relation to their actual work? She argued that to get a coherent picture of both (and of possible gaps between them), researchers should employ methods that coordinate observation data from teachers’ real work in classrooms and interview data in which teachers explain these classroom data. (C)

This excerpt includes a consideration of using appropriate data collection methods in the research student’s research project. In doing so, information on the gap between professed beliefs and classroom practices (from Fang, 1996 and Thompson, 1992) is pointed out. Then there is literature (from Thompson, 1992) promoting the adjustment of methods to reconcile this methodological gap. This information on research design expresses the research student’s methodological strategy, which is to “coordinate

observation data from teachers' real work in classrooms and interview data in which teachers explain these classroom data". Information on research method is engaged in the particular research design of a study.

This analysis of method information suggests that research method is not only explained but also needs to be engaged in the literature review. It demonstrates two major ways of engaging research methods: the research method of the study itself may be evaluated to determine its validity, and articulations about research methods need to be considered when designing a particular method for a research project. However, in the data there are few examples found that consider the engagement of method information. This suggests that reviewing and engaging with research method/design may not be regarded as significant in the literature review section of a thesis. This raises the question as to whether and to what extent a literature review needs to embrace the review and evaluation of research methods from past studies. This issue has to be left for later study since so far there has been little investigation in research education.

7.2.3 Method information relating to the research context

Information relating to research context was also found in the data. This is information which refers to presumptive information in terms of the general research background or theoretical underpinnings of a study. Such information provides a basis on which a method may be appropriately used.

The data demonstrates that information of research context was reviewed and/or engaged by these Asian students. For example, this excerpt demonstrates that research context is included in reviewing particular literature:

As example of the latter, in which classroom practices in Asian countries and the US were compared, Stevenson and Stigler (1992) and Stigler and

Perry (1988) used substantial classroom observations. (C)

In the first part of this excerpt is the sentence “classroom practices in Asian countries and the US were compared”. It considers the location of the research conducted. This information can be regarded as research context since it provides the background information of a study, yet there is no further engagement with this method-related information. This information occupies a peripheral position in this excerpt, and there is no more articulation of this research context itself in terms of its details and how it informs the research student’s research project.

In actuality, there is evidence suggesting that the general background of a research student’s research project is considered in the literature review. A research background is not only construed through relevant literature, but also “installed” in the whole research project. The excerpt below is one example manifesting the research student’s engagement with research context information.

Two main reasons underlie the choice to conduct this study in China. First, ... this curriculum and the way Chinese teachers use it have been the focus of growing interest and research (Cai, 2000; Fan et al., 2006; Geary, Bow-Thomas, Liu, & Siegler, 1996; Jiang & Eggleton, 1995; Wang & Cai, 2007; Watkins & Biggs, 1996). ... the first-rate Chinese student outcomes in mathematics and the contrast with the non-centralised, reform-oriented educational systems in the Western world (Xie & Carspecken, 2008) ... In particular, the two schools in which this study was conducted are in Zhejiang (province); in both, the Chinese national curriculum serves as the main teacher resource and guide. Second, the researcher was born and grew up in Mainland China, and experienced its educational system as a student through to completion of her first university degree. Then, she moved to Australia and experienced its educational system as a master’s and a doctoral student. ... In such a study, the researcher’s experience and

perspective constitute part of the research instruments (Adler & Adler, 1994; Bogdan & Biklen, 1992; Guba, 1990). This researcher was therefore positioned as both an insider familiar with Chinese education and culture and as an outsider who observes Chinese teachers' work through her experience of Australian education. (C)

The above excerpt describes the reasons for conducting the research in China. These include the research interest in Chinese mathematics education in past studies and the unique background of the researcher herself. Yet, these reasons are not merely presented by the research student's own accounts. The presentation of these backgrounds involves the support of relevant literature. It refers to literature on Chinese teaching and learning mathematics; and it engages with the literature on studies of qualitative inquiry. Both sources of information present the research background of the research student's study.

Moreover, the research background is integrated into the consideration of the research project. The sentence – “the two schools in which this study was conducted are in Zhejiang (province); in both, the Chinese national curriculum serves as the main teacher resource and guide” – delineates the specific sites of investigation against the background of Chinese mathematics education. Likewise, the last sentence that characterises the researcher's positions as both an insider of Chinese education and outsider with an Australian educational perspective informs readers of the researcher's status in her study. These reasons, supported by literature, constitute the research background which is fitted to the whole research project. This example of research context illustrates one possible way of engaging with method information in the literature review.

Information of research context is not limited to the general research background. It also refers to some theoretical accounts which are also anterior to a research. The following is an example for the theoretical background information.

Ma's (1999) seminal study, which drew on Shulman's (1986) key notions of content knowledge and pedagogical content knowledge, addressed the relationship between those two types of knowledge in US and Chinese teachers. (C)

This excerpt identifies theoretical information relevant to Ma's (1999) study. Shulman's (1986) notions of content and pedagogical knowledge play the role in the theoretical context in Ma's study, however, this theoretical context is merely mentioned, and one may not know further information about the theory itself nor the implications of this information to the theory of the research student's research project. This raises concerns over the significance of reviewing the theoretical contexts of past studies and the extent to which such information may be engaged in the research student's research project.

There is another kind of theoretical information which is about theory itself. Not only the studies applying a particular theory are reviewed, but this theory is also engaged in the research student's research project. The researcher considers this as an example of "method information engaged" with respect to information of research context. This is shown in the following excerpt:

That the van Hiele's levels are viewed as having continuing relevance in research and teaching can be seen from recent studies that were based on its theoretical framework (e.g., Halat, 2006; Hartweg, 2005; Groth, 2005; Wu & Ma, 2005). [...]

The theory is applied here in a number of ways: the progression of the stages guides the design of the geometry curriculum that is used in this project; the need to take students' van Hiele level into consideration when carrying out instruction is taken as a given; language development is seen

as a vital part of geometry instruction; helping students attain higher levels of geometric thinking is a pedagogical goal. (S)

This is a composite excerpt in two parts. The first part suggests the van Hiele's levels as a theory applied in recent studies on geometry teaching and learning. The second part considers the use of this theory specific to the research student's research project. In this sense, the van Hiele's levels are not merely reviewed in the literature. The review also refers to the research student's research in terms of the specific use of this theory. Compared with the "method information reviewed", the "method information engaged" (as this excerpt exemplifies) offers a more comprehensive perspective on the review of method information in the literature. This comprehensive review of method information is perhaps more succinct and coherent in positioning research students' research in the literature (Boote & Beile, 2005; Holbrook et al., 2007).

7.2.4 Method information relating to research process and result

The remaining two items within method information are research process and result. In contrast with research context which is anterior to research method, they are considered as the practical outlook of a research method. The excerpt below is a review of research process in a study:

For example, Fuchs, Fuchs, Hamlett et al. (1997) examined the effect of peer-mediated instruction (PMI), a type of peer tutoring, on mathematics achievement. Forty, second- to fourth-grade teachers and their students were assigned to PMI with training in elaborated help and in methods for providing conceptual mathematical explanations (PMI-EC) and a contrast group (no PMI). The mathematics achievement of 4 students who represented 4 points on the achievement continuum (learning disabled, low-, average-, and high achieving) were evaluated from each of the 40 classes. (H)

This excerpt includes information about how the effect of peer tutoring is examined. The research process is demonstrated in terms of the numbers and identities of participants, the allocation of participants, and the evaluation of participants' mathematics achievement. However, the research process of the study (Fuchs, Fuchs, Hamlett et al., 1997) is merely reviewed without further comment. There is no explanation about the significance of presenting the research process in detail; neither is there evaluation of the research process on its influence in generating valid research results, nor is there articulation of how this review guides the specific research design of the research student's project. In actuality, there is engagement of research process to be found in the data. This mostly happens when considering the research process of the research student's own research project. This may be exemplified in the following excerpt:

The literature reviewed above points to DGS being a potentially useful tool to advance geometrical reasoning in the classroom. DGS features that are particularly relevant in encouraging students' reasoning, such as the drag-mode and the flexibility for experimentation, are incorporated in the teaching project during the course of the study. (*S*)

In this excerpt, there is explanation of how information from the literature may be used in the research student's research project. Literature on Dynamic Geometry Software (DGS) is reviewed. The literature is engaged in the research student's research process. It states that "DGS features [...] are incorporated in the teaching project during the course of the study". This suggests that the research student's research process is guided by prior knowledge from the literature. This connection between literature and research process manifests the significance and coherence of reviewing or engaging method information.

Lastly, information on the research result was found in the data. The object “research result” may be similar to “phenomena” as discussed in Chapter 6. Both of them are concerned with the findings of a study, but there is difference between them. Research results are more limited to reporting the data in a study, while research phenomena give a more generalised view on the issue researched. The generalisation of phenomena, then, is based on the results of the data analysis. This can be exemplified in the following excerpt:

Results showed that the achievement of PMI-EC students was higher than the contrast group. These results suggest that academically-orientated peer tutoring research has a positive impact on academic achievement. (*H*)

This excerpt from the Hong Kong thesis includes information on research result and phenomenon. Specifically, by comparing the two sentences, it can be seen that the information in the first sentence deals with research results, and the information in the second is more in accord with the phenomenon in the study. This is because the information in the two sentences occupies different levels of description in the findings. The finding in the first sentence remains at the data level, which reports the participants’ achievements, while the finding in the second sentence reports the research phenomenon that presents a more generalised view of the issue researched. In this sense, the second part of the information is about the review of research phenomenon which has been considered in Chapter 6. However, the generalisation of a phenomenon is based on the research result – one of the objects belonging to method information.

By clarifying the nuance between research phenomenon and research result, the researcher now will further consider the information of research result. As the former excerpt shows, research results are often identified through the words “Results showed that...” This can be also exemplified in the following excerpt:

[...] Wassef, Mason, Collins, VanHaalen, and Ingham (1998) conducted a peer support intervention in a sample of 118 Grade 14-19 students. Results showed that there was significant improvement in the interpersonal (e.g., family relations, making supportive friendships), internal (e.g., self-worth, coping with stress) and school (e.g., attitude towards school, school work) domains. However, research critically analysing the impact of diverse peer support interventions has often been plagued with theoretical and methodological flaws. (*H*)

Comparing the present excerpt with the one immediately preceding, it is identified that both include the information of research result. In the former excerpt, the research results are the different achievements of the participants; in the present excerpt, the research results show the improvement resulting from peer support in the three domains. However, there is difference in the presentations of research results as shown in the excerpts being compared. In the former excerpt, the research results are merely reviewed without further comment. It is considered to be “method information reviewed”. In contrast, in the present excerpt, research results are not only reviewed but also evaluated regarding their validity, as expressed in the last sentence – “research critically analysing the impact of diverse peer support interventions has often been plagued with theoretical and methodological flaws”. This sentence manifests the re-examination of research results by interrogating the theoretical and methodological flaws in peer support studies. Although details are lacking on how these flaws may influence the results of peer support studies, their articulation at least displays a consideration of research validity and embraces a sceptical perspective. The evaluation of research results can be considered “method information engaged”.

This section has delineated several elements of method information in the data. They include research focus, research method/design, research context, research process and results. Different from the information on subject vocabularies or phenomena, these types of information are related to research methods. They may be perceived as

discursive objects that constitute the “grids of specification” of method information (Foucault, 1972; Willig & Stainton-Rogers, 2008).

In relation to these objects of method information, there are several enunciative positions being invoked. In actuality, some enunciative modalities have already been revealed in the above discussion of various objects on method-related information. They are categorised into “method information reviewed” and “method information engaged”. The two categories have characterised the enunciation simply as reviewing or engaging method information, while there are more specific enunciative positions yet to be raised. These positions are discussed in Section 7.3 ahead.

7.3 The enunciation of method-related literature use

This section analyses the enunciative modes in relation to the objects of method information. Like the enunciative modes found in the enunciation of subject vocabularies and topics, phenomena and variables, enunciating the objects of method information also entails one to occupy similar subject positions which include but are not limited to “synthesising subject”, “summarising subject”, “comparing subject”, “evaluating subject”, and “integrating subject”.

7.3.1 Summarising and synthesising subject positions

The data from the six Asian theses demonstrate that the summarising subject position is occupied when reviewing method-related information. First of all, this subject position is found in their enunciations of research method and research design. The following are two excerpts from the Hong Kong thesis:

A few studies have adopted longitudinal research designs to examine the maintenance effect of peer tutoring. For example, Greenwood, Delquadri, and Hall (1989) conducted a longitudinal investigation. (*H*)

This review also evaluated the effect of peer tutoring regarding intervention features such as research design. Eight of these studies used pre-post group design, eight using no-treatment control group design and eight employing alternative instructional activities as control group in experimental design.

(H)

The first excerpt summarises the research method used in a group of studies examining the maintenance effect of peer tutoring. As such, a longitudinal research method was used in past peer tutoring studies. The second excerpt concerns various research designs in the study of the effect of peer tutoring. In this excerpt, the research student summarised different research designs such as pre-post group design, no-treatment control group design, and a design of employing alternative instructional activities for control group. The information given is a summary of various research designs on a common research problem.

The information in these excerpts is not from a single information source but an amalgamation of different sources. Thus the research student, the research candidate in this context, also has to be the synthesising subject to collate the information. However, this group of information is not a random synthesis of individual works. Rather, there is a common ground based on which different sources of information may be combined. With a common ground, research students are able to order the synthesised information in a particular way, while this particular way of synthesis manifests the particular subject position research students can occupy. Therefore, the research student's particular subject position in the two excerpts above can be seen as the summarising subject, based on corresponding common grounds – research method in the first excerpt and research design in the second. Research method and research design in the two excerpts are the discursive objects based upon which relevant information can be concerned and summarised. This suggests that one does not need to repeat the research method or design used in each study. A summary of the methods

or designs used in all the studies is enough to synthesise the information reviewed. Hence, in the excerpts examined, the summarising subject is the specific outlook of the synthesising subject.

However, the summarising subject may not always confer with the synthesising subject in a formulation. The summarising subject may also be found when one is dealing with a single information source. This is the case when information on research process is enunciated. See this excerpt on the articulation of the research process:

For example, Fuchs, Fuchs, Hamlett et al. (1997) examined the effect of peer-mediated instruction (PMI), a type of peer tutoring, on mathematics achievement. Forty, second- to fourth-grade teachers and their students were assigned to PMI with training in elaborated help and in methods for providing conceptual mathematical explanations (PMI-EC) and a contrast group (no PMI). The mathematics achievement of 4 students who represented 4 points on the achievement continuum (learning disabled, low-, average-, and high achieving) were evaluated from each of the 40 classes. (*H*)

In the excerpt, the research student described the specific process of the study undertaken by Fuchs et al. This study is about examining the effect of a particular type of peer tutoring on mathematics learning. The information on the research process includes the participants' practices and the scholars' management of the data, that is, the research student noted the participants in the study and the activities they undertook. Meanwhile, the information of how the scholars deal with the data is summarised. Since one cannot present all the information on the research process of a study in his or her literature review, a summary of these processes is necessary. Hence, reporting information on the research process from a single study requires one to occupy the summarising subject position. Moreover, this subject position does not necessarily invoke the synthesising subject since here one is addressing a single information

source.

7.3.2 Comparing subject positions

The second primary subject position identified in the data is the comparing subject. The comparing subject is mentioned in the analysis of enunciating phenomena and variables. Within the enunciation of method information, this subject position is actualised in the articulation of the research focus. The excerpt relevant to this subject is as follows:

In the past, social support research has put much effort into examining the effect of global perceptions of social support. The overall social network, its size and density were thus commonly examined. However, social support research has increasingly focused on assessing the support provided by particular supportive figures, and examining the relation between these more specific measures and psychological wellbeing. (*H*)

This excerpt consists of three sentences and the information in it is about research focuses in social support research. Information in the first two sentences concerns the research focus in the examination of “the effect of global perceptions of social support”, while the third sentence refers to another form of research focus in social support research. The information indicates that the research focus in social support research has undergone a transformation, from examining the effect of global perceptions of social support to the assessment of the effect of particular supportive figures and measures. This difference is noted when one occupies the comparing subject position. However, in this excerpt, comparing the difference between research focuses is not possible without the function of other subject positions.

The synthesising and summarising subject positions are also invoked in this formulation. The two subjects have been discussed in the Section 7.3.1 and they

perform similar effects in the present excerpt. First, generalising the information on research focuses in social support research involves one synthesising multiple studies in that field. There is not only one study examining the effect of global perceptions of social support, neither is there only one study concerning the effect of supportive figures or measures. To enunciate the transformation of research focuses in social support research, one has to encounter multiple studies in this field. However, since there is no reference for this particular kind of information, one may not know whether the derivation of the information is from reviewing and synthesising multiple studies. This raises the issue of availability in scholastic communication (Bruce, 2001). However, to produce a credible information on the development of research focuses in a research field one necessarily occupies the position of the synthesising subject, through whom the available and relevant literature may be synthesised.

Another subject position involved in this enunciation is the summarising position. This is also made clear in the formulation of the excerpt. Studies on each research focus can be numerous, although of course one does not need to specifically report all the studies in the literature review. Summarising the studies by their common research focus is sufficient to illuminate the development of social support research. The excerpt examined above primarily manifests the comparing subject position that one occupies in the enunciation of the research focus. However, a composite group of subject positions are found in this excerpt. The formulation of this excerpt not only involves one occupying the comparing subject position, the synthesising and comparing subjects are also operative. All these subject positions are in relation to the research focus – one object (Foucault, 1972) of method information – either synthesising, summarising it in the literature or comparing it. This implies that one may occupy different subject positions in a formulation. The subject positions fostered do not depend on the number of sentences, but depend on the discursive objects in the formulation (Foucault, 1972).

7.3.3 Evaluating subject

Another important subject position operating in the enunciation of method information is the evaluating subject. The evaluating subject enables one to consider the significance or importance of a practice (Boote & Beile, 2005; Holbrook et al., 2007). Contextualising this in the enunciation of method-related information, the subject position may be manifested in articulating research method and research focus. The following excerpt demonstrates an evaluation on the appropriate use of research method:

... as Fang (1996) and Thompson (1992) cautioned, there may be wide inconsistencies between professed beliefs (what teachers say) and classroom practices (what teachers do). In this regard, Thompson (1992) raised a conceptual and methodological issue: How may one examine teachers' thinking in relation to their actual work? She argued that to get a coherent picture of both (and of possible gaps between them), researchers should employ methods that coordinate observation data from teachers' real work in classrooms and interview data in which teachers explain these classroom data. (C)

In this excerpt, the problem of the interview research method is considered in research of teachers' conceptions and their instructional practices. First, the problem with the interview method has been noted as "wide inconsistencies between professed beliefs (what teachers say) and classroom practices (what teachers do)". Thompson (1992) proposes a modification on the research method. By occupying the position of the evaluating subject, this Chinese research student not only focused on problems with a particular research method but also considered the appropriate use of the research method in the context of her research project. Becoming the evaluating subject enables one to engage and evaluate the information on research method.

The evaluating subject also can be seen in the enunciation of research focus. Below is an excerpt where this subject position is playing a role. The evaluating subject is manifested when information is used to evaluate the significance of the research focus:

When a study includes a focus on teacher epistemological stances, one should take into account that those stances “may be shaped largely by culturally shared experiences and values” (Correa et al., 2008, p. 140). [...] This view is consistent with Leung’s (1995) assertion that researchers in cross-cultural curriculum studies are becoming increasingly aware of the need to look at instructional practices in the classroom as an instance of the cultural milieu in which these practices are situated. (C)

This excerpt considers cultural variables as the research of mathematics teachers’ teaching practices. This consideration requires one to occupy the position of the evaluating subject. The first sentence declares the research focus of “culturally shared experiences and values” to understand teachers’ epistemological stances, and the second sentence addresses the significance of this research focus.

In addition to evaluating the significance of a research focus, one may also occupy this evaluating subject position in regard to how a research focus can be studied. The excerpt below demonstrates this enunciative mode:

They [Drew and Sorjonen] note that “[t]he comparative perspective is fundamental to work in this area, and it is worth emphasising that research efforts into ‘ordinary conversation’ and institutional discourse are mutually informative; therefore, research into institutional discourse is best undertaken in conjunction with, or with reference to, research into non-institutional talk” (Drew and Sorjonen, 1997, p. 110). (J)

This excerpt is concerned with how a research focus is approached in the literature. The research focus is about workplace conversation through which individuals' language, identity, and culture are construed. Thus, this research focus necessarily invokes literature on institutional conversation. This research orientation is evaluated in the excerpt above. It suggests a comparative perspective which embraces both ordinary and institutional conversation studies. This perspective is the result of one occupying the evaluating subject position, that is, one is concerned with the complex nature of conversation study and the mutually informative character between research focuses on ordinary and institutional conversations.

One may also occupy this evaluating subject position in relation to research context. This is revealed in the general context of the research student's research project. In the excerpt below, which also appeared in Section 7.2.3, and one may discern the evaluating subject position:

Two main reasons underlie the choice to conduct this study in China. First, ... this curriculum and the way Chinese teachers use it have been the focus of growing interest and research (Cai, 2000; Fan et al., 2006; Geary, Bow-Thomas, Liu, & Siegler, 1996; Jiang & Eggleton, 1995; Wang & Cai, 2007; Watkins & Biggs, 1996). ... Second, the researcher's experience and perspective constitute part of the research instruments (Adler & Adler, 1994; Bogdan & Biklen, 1992; Guba, 1990). This researcher was ... positioned as both an insider familiar with Chinese education and culture and as an outsider who observes Chinese teachers' work through her experience of Australian education. (C)

In this excerpt, the research student provided two reasons for conducting her research in China. These reasons can be perceived as the context in which her research is conducted. The first reason characterises the research context as a growing interest in research on curriculum in China and Chinese teachers' teaching. The significance of

research on Chinese teachers' teaching is evaluated, which requires one to occupy the evaluating subject position to articulate this research context. Similarly, this subject position is also performing in the enunciation of the second reason. The second reason considers the research student herself in the position as both "an insider familiar with Chinese education and culture and an outsider who observes Chinese teachers' work through experience of Australian education". This position of research student constitutes part of the research context. Here, the research student considered the significance of her role in the research. Thus, by occupying the evaluating role, one is evaluating the importance of her/his position in a study.

Lastly, the evaluating subject position is also found in the articulation of the research result. The excerpt below is such an example:

The benefits of these peer support interventions have been reported. For example, Naylor and Cowie (1999) conducted a large-scale survey ... Wassef, Mason, Collins, VanHaalen, and Ingham (1998) conducted a peer support intervention ... However, research critically analysing the impact of diverse peer support interventions has often been plagued with theoretical and methodological flaws. (*H*)

This excerpt first demonstrates the research on peer support interventions and presents the research results of individual studies. The research results are not merely reviewed. Rather, the validity of the results are evaluated. This involves one occupying the evaluating subject position. In a sense, this evaluation is exercised by considering the theoretical and methodological issues in these peer support intervention studies. However, this evaluation is not fully unfolded. The theoretical and methodological issues are merely noted and there is lack of further elaboration. The last subject position identified in the data is the integrating subject.

7.3.4 Integrating subject

The integrating subject refers to one who integrates the literature into the research. There are several possible ways of integrating the literature into a research project. These ways can be found in relation to the objects of the method information one is speaking (Foucault, 1972). Specifically, this subject position may be found when one is articulating research focus, research method, research context, and research design. This excerpt is an example of the integration of research focus:

However, this notion of a construct validity approach to the study of intervention effects (see Craven et al., 2003) has not been utilised in previous peer support intervention studies. To address the issue, the present investigation examined and contrasted the differential effects of two types of peer support interventions (an academically-orientated peer tutoring intervention in Study 3 and a socially-orientated peer support intervention in Study 4 & 5) to study their differential effect on multidimensional self-concepts. (*H*)

This excerpt refers to two research focuses: “academically-orientated peer tutoring intervention” and “socially-oriented peer support intervention”. These focuses are derived from the literature review and integrated into the research problem under investigation. This integration from the literature to the research project entails research students occupying the integrating subject position. Similarly, this position is also operating in the enunciation of other areas such as research method, research context, and research design. For example, a PhD student may occupy the integrating subject position when reviewing the literature on research method and utilising it in the research method. According to the data, research student evaluated the appropriateness of the interview method and modified it in the research method³.

³ Excerpt exemplifying this point of view: A challenging problem in studying teachers’ conceptions and their instructional practices is that only some elements of this endeavour, such as teachers’ actions and language, are observable. The views that underlie teachers’ overt behaviours are implicit and may be hard to access and infer. ...

Likewise, connecting the research context with a research project also entails the integrating subject. Research students can review the literature relevant to the theoretical context of a research, and then integrate the theory by articulating its use in the research project⁴. Lastly, the integrating subject position can be taken when reviewing the literature in relation to research design. In the Singaporean case, literature on DGS is reviewed, and this information used to design the teaching project in its research student's research⁵. This suggests that one is acting as the integrating subject when reviewing the literature to articulate the specific research design of the study.

The present analysis is to consider the enunciative modalities relevant to the review of method information. Specifically, five major subject positions can be found. They are the synthesising subject, summarising subject, comparing subject, evaluating subject, and integrating subject. These subject positions may be found in relation to the enunciation of various objects such as research focus, research method, research context, research design and result. And they are ordered according to the degree of complexity of the information practices. The last section in this chapter is an analysis of the concepts operating in the practices of method-related information.

Moreover, as Fang (1996) and Thompson (1992) cautioned, there may be wide inconsistencies between professed beliefs (what teachers say) and classroom practices (what teachers do). In this regard, Thompson (1992) raised a conceptual and methodological issue: How may one examine teachers' thinking in relation to their actual work? She argued that to get a coherent picture of both (and of possible gaps between them), researchers should employ methods that coordinate observation data from teachers' real work in classrooms and interview data in which teachers explain these classroom data. (C)

⁴ This may be demonstrated by the excerpt: That the van Hiele's levels are viewed as having continuing relevance in research and teaching can be seen from recent studies that were based on its theoretical framework (e.g., Halat, 2006; Hartweg, 2005; Groth, 2005; Wu & Ma, 2005). ... The theory is applied here in a number of ways: the progression of the stages guides the design of the geometry curriculum that is used in this project; the need to take students' van Hiele level into consideration when carrying out instruction is taken as a given; language development is seen as a vital part of geometry instruction; helping students attain higher levels of geometric thinking is a pedagogical goal. (S)

⁵ This is found in the excerpt: The literature reviewed above points to DGS being a potentially useful tool to advance geometrical reasoning in the classroom. DGS features that are particularly relevant in encouraging students' reasoning, such as the drag-mode and the flexibility for experimentation, are incorporated in the teaching project during the course of the study. (S)

7.4 The concepts of information practices

This section analyses the data in terms of examining the concepts “relevance”, “coherence”, “criticality”, “creativity”, and “research as inquiry” in the review of method information.

7.4.1 *Concept of relevance*

Relevance as demonstrated in Chapters 5 and 6 is the most basic concept on information practices. It simply refers to relevant relations between groups of information and/or between information and the research undertaken. In this sense, the method information present in the literature review can all be perceived as subject to this concept. Method information included in the literature review must be relevant to a research project. This relevance is usually easily identified. For example, method information in the following excerpt was collected based on the concept of relevance:

There are a number of studies conducted in the area of gifted education. [...] There are studies on a conceptual framework on the risk and resilience in gifted children (Neihart, 2002), seminal articles concerning socio-emotional issues, underachievement, counselling of gifted and talented students to address the affective needs of special populations (Moon, 2004) ... Moreover, many research projects also focus on underachievement in gifted children (Reis & McCoach, 2002), and the cognitive complexity and emotional intensity of gifted students (Silverman, 2000). (V)

This excerpt is comprised of various research focuses on gifted education. These research focuses may be grouped in a literature review since they are relevant on the basis of a common research field. Objectively, this relevance may be immediately discerned. According to the data, relevance between different pieces of method

information is usually established in this objective sense. Groups of information about research focus, research method, research design or result can be synthesised and summarised because their relevance can be objectively discerned. For example, the following excerpt demonstrates the research designs in past studies:

This review also evaluated the effect of peer tutoring regarding intervention features such as research design. Eight of these studies used pre-post group design, eight using no-treatment control group design and eight employing alternative instructional activities as control group in experimental design.
(H)

Different research designs may be grouped because they are relevant to studies of peer tutoring interventions. This relevance based on the common research topic can be objectively discerned in their immediacy (Bruce, 2001). There is no requirement to subjectively identify this relevant relationship between the research designs, however, according to Bruce (2001), relevance on some occasions has to be established through a subjective approach. This usually involves the notion of breadth – that literature beyond a particular research topic is included. In the context of including method-related information, this refers to the information on research focuses, methods, contexts, designs or results that is beyond the area of research interest but is relevant in the context of the research project. This relevance has to be subjectively identified. Unfortunately, there is no significant evidence found in the data. The study reported in this thesis cannot demonstrate this subjective approach to relevance in the consideration of method information. However, this subjective approach provides an alternative view of relevance. Research students can consider the inclusion of method information beyond their research interests. This perspective on method information with respect to the concept of relevance needs to be investigated in further studies.

7.4.2 Concept of coherence

As discussed in Chapter 6, coherence is a specific form of relevance. This form is twofold (Holbrook, et al., 2007). One concerns the extent to which the information used may advance an argument in the literature review, and the other considers the accurate use of information which involves a “working understanding” (Holbrook, et al., 2007) and “availability” (Bruce, 2001). In the context of method-related information practices, one may identify the former type of coherence when the literature is engaged in the formulation of a research project. Coherence is actualised when one occupies the integrating subject position to enunciate various objects of method information. For example, coherence is operating in the following excerpt on the application of appropriate research method:

[...] as Fang (1996) and Thompson (1992) cautioned, there may be wide inconsistencies between professed beliefs (what teachers say) and classroom practices (what teachers do). In this regard, Thompson (1992) ... argued ... researchers should employ methods that coordinate observation data from teachers' real work in classrooms and interview data in which teachers explain these classroom data. (C)

This excerpt considers the appropriate use of research method in its research student's research project. It reviews the literature (Fang, 1996; Thompson, 1992; Thompson, 1992) on the interview method and engages with the literature to formulate the method of the research student's research. This way of reviewing and engaging with the literature manifests the concept of “coherence” in the method-related information practices. Likewise, coherence may be identified in the articulation of other objects. The excerpt below demonstrates the review of research focuses in which coherence is invested:

[...] this notion of a construct validity approach to the study of intervention effects (see Craven et al., 2003) has not been utilised in previous peer support intervention studies. To address the issue, the present investigation examined and contrasted the differential effects of two types of peer support interventions (an academically-orientated peer tutoring intervention in Study 3 and a socially-orientated peer support intervention in Study 4 & 5) to study their differential effect on multidimensional self-concepts. (*H*)

Prior to this excerpt, the research student reviewed the effect of various peer tutoring interventions. Two research focuses “academically-orientated peer support intervention” and “non-academic peer support intervention” are then included in the research student’s research project. This review of research focuses positions the argument of the research that is to investigate and contrast “the differential effects of two types of peer support interventions”. Coherence is manifested, in that the literature on research focuses coheres with the research investigated. However, in some occasions, there is a lack of coherence in the articulation of the method information. This may be found when one is reviewing the information of research design/process:

For example, Fuchs, Fuchs, Hamlett et al. (1997) examined the effect of peer-mediated instruction (PMI) ... Forty, second- to fourth-grade teachers and their students were assigned to PMI with training in elaborated help and in methods for providing conceptual mathematical explanations (PMI-EC) and a contrast group (no PMI). The mathematics achievement of 4 students who represented 4 points on the achievement continuum (learning disabled, low-, average-, and high achieving) were evaluated from each of the 40 classes. (*H*)

This excerpt reviews the research process of Fuchs, Fuchs, Hamlett et al. (1997) on the effect of peer-mediated instruction. However, this review of research process does

not seem connected to the Hong Kong research student's research project. It does not state the implications of this research process to the research in question. Although not all the method information reviewed has to state its relation with the research project, it can be argued that it is of necessity to consider the relation between the method information reviewed and the research project conducted. In particular, when there is a detailed review of method information (as the information of research process in this excerpt), one needs to contemplate the significance of including this information in the literature review.

Another issue relevant to the lack of coherence is the accurate use of method information. This is revealed when some method-related information in the data lacks references. This may be exemplified in the excerpt below:

The benefits of these peer support interventions have been reported. For example, Naylor and Cowie (1999) conducted a large-scale survey ... Wassef, Mason, Collins, VanHaalen, and Ingham (1998) conducted a peer support intervention ... However, research critically analysing the impact of diverse peer support interventions has often been plagued with theoretical and methodological flaws. (*H*)

The above excerpt reviews some studies on peer support interventions. The research results from the studies are evaluated in terms of their theoretical and methodological flaws. This evaluation, however, lacks specific references, and there are no references contextually accounting for this particular information. This raises the issue of availability of the information claimed (Bruce, 2001). The accurate use of information is based on the information which is physically and locally accessible. However, the accuracy of information is problematic when there is no reference supporting the availability of the information in the literature. The problems relevant to the concept of "coherence" need to be noted when one reviews the method-related information in the literature.

7.4.3 Concept of criticality

Criticality is an important concept in information practices. According to the descriptions in Chapter 4, criticality consists of “critical synthesis”, “distinguishing ambiguities”, and “critical appraisal”. Among these forms of criticality, critical appraisal is perhaps most related to the method-related information practices. It involves critically evaluating the appropriateness of research methodologies and the critical rationalisation of research significance (Boote & Beile, 2005). Critical appraisal can be found in the data. For example, in the preceding excerpt that considered the accurate use of information, one may also discern the presence of critical appraisal. The last sentence – “research critically analysing the impact of diverse peer support interventions has often been plagued with theoretical and methodological flaws” – indicates a critical evaluation of the validity of research results in past studies. This suggests that the concept of criticality is operating in the enunciation of method information. However, one may notice that critical appraisal as such merely points out the limitations while these limitations are not fully elaborated. There is no further information on how the theoretical and methodological flaws have an impact on the validity of the research results. This example suggests that one needs to consider the sufficiency of the critical examination of method information when it is critically examined in a literature review. This example demonstrates the critical evaluation within the literature reviewed, while there is another group of articulations where method information relevant to the research project itself is critically evaluated.

The critical evaluation of method information which is related to a research project is exemplified in the following excerpt:

[...] as Fang (1996) and Thompson (1992) cautioned, there may be wide inconsistencies between professed beliefs (what teachers say) and classroom practices (what teachers do). In this regard, Thompson (1992) ...

argued ... researchers should employ methods that coordinate observation data from teachers' real work in classrooms and interview data in which teachers explain these classroom data. (C)

As mentioned before, this excerpt articulates an appropriate data collection method for the research student's research project. In doing so, one needs to critically evaluate the research method in the literature and consider whether the method may address the research problem. This suggests the concept of criticality operating in this formulation, that is, one "critiqued appropriateness of research methods to warrant claims" (Boote & Beile, p. 8). Critical appraisal of research method relevant to a research project, however, is rarely found in the data. According to the data examined, only one out of the seven cases includes this consideration in the literature review. This is perhaps because this part of evaluation is mostly in the methodology chapter, where appropriate selection of research method is considered. However, this singular case raises the questions of whether and to what extent evaluations of a research student's research method should appear in the literature review. It can be argued that dealing with these questions in later research may help to better understand the constitution of a literature review and provide a clearer picture of thesis writing for research students.

7.4.4 Concept of creativity

Creativity in the context of information practices refers to the formation of "disciplinary perspectives" (Holbrook et al., 2007) and/or the generation of new research methods (Boote & Beile, 2005). However, it is not easy to create new things, particularly in method-related information practices. One cannot produce a new method which is beyond orthodox research methods. Thus, creativity has its specific interpretation in the practices of method information. One may consider it to be creativity when a particular research method is used or a research focus is located in the research project. Again, this is exemplified in the above excerpt, where the research method in the research student's research project is considered. By reviewing the

limitations of the interview method, the research student employed a method that may coordinate both the observation and interview data. This is not a ground-breaking method for conducting research. In the context of this particular research project however, it is a research method created and used by the research student for addressing a particular research problem. Creativity not only refers to the generation of a research method that fits in a research problem, but also means the generation of the research problem itself. The creation of a research problem can be found in the following excerpt:

As Confucianism is part of Vietnamese culture, it is important to recognise that such philosophy imposes a great impact on gifted students in Vietnam. How Confucianism plays the role in shaping the psychosocial development of these gifted students in Vietnam is an important question that needs to be addressed in this study. (V)

This excerpt sets out one of the research questions that the research student intended to study in her research project. This research question is generated through the review of relevant literature. Thus, it indicates the presence of the concept of “creativity” operating in this formulation.

Creativity in Chapter 5 is manifested when one generates a new term from the literature. This new term can better capture the complexity of a problem where other similar terms in the literature cannot. In Chapter 6, creativity can be found when a new perspective is attached to a study. This alternative view appears when one examines the study by conferring it with other studies in the literature. Both instances suggest that creativity is operating when one reviews the information on subject vocabularies or research phenomena. Likewise, according to the data analysed, the enunciative function of creativity is present when one reviews method information. Nonetheless, creativity in method information does not mean to generate new things which did not exist in past studies. Although it is possible, it is not essential for one to “invent” an

innovative research focus, or devise a completely new method or process to investigate a research problem. Rather, creativity in method information is about the generation of perspectives on the research focus being studied or the method and process being applied for one's research project. Such perspectives on one's research focus, method, or process manifest the relation between one's research and past studies in the literature. In a sense, one may possibly shift the manner of enquiry somewhere else to address his or her own research through re-contextualisation, while it is less likely for one to generate new ideas on method beyond past method-related information.

7.4.5 Concept of "Research as Inquiry"

Research as Inquiry refers to "an understanding that research is iterative and depends upon asking increasingly complex questions whose answers develop new questions or lines of inquiry in any field" (ACRL, 2014, p. 6). This is the case when research focuses are reviewed, compared and integrated, as shown here:

In the past, social support research has put much effort into examining the effect of global perceptions of social support. The overall social network, its size and density were thus commonly examined. However, social support research has increasingly focused on assessing the support provided by particular supportive figures, and examining the relation between these more specific measures and psychological wellbeing.

... this notion of a construct validity approach to the study of intervention effects (see Craven et al., 2003) has not been utilised in previous peer support intervention studies. To address the issue, the present investigation examined and contrasted the differential effects of two types of peer support interventions (an academically-orientated peer tutoring intervention in Study 3 and a socially-orientated peer support intervention in Study 4 & 5) to study their differential effect on multidimensional self-

concepts. (*H*)

This composite excerpt considers the review and integration of research focuses in the literature. In the first paragraph, different research focuses in the area of social support research are reviewed and compared, stating the development of research on social support. In the second paragraph, the research focuses are zoomed in on two main types of peer support interventions – academically-oriented peer tutoring intervention and non-academic peer tutoring intervention. The two types of intervention make up the research questions in the research student’s research project – the derivation of research questions is based on lines of inquiry which have been addressed in past studies (ACRL, 2014). In the context of this excerpt, the lines of inquiry refer to research focuses on social support studies. These research focuses provide a knowledge base for the research student’s research on peer tutoring. Reviewing and comparing these focuses in the literature enable the identification of one’s own research focuses which are produced as research questions. This process manifests what the concept “Research as Inquiry” has delineated. Contemplating the concept “Research as Inquiry” is significant since it enables one to trace the lines of inquiry in the literature. This echoes the first criterion in Boote and Beile’s (2005, p. 8) synthesis of literature: “Distinguish what has been done in the field from what needs to be done.” One then retains a map of inquiries in which one’s own research can be located. It also enables one to present the research to the audience in an order of systematism which provokes another formerly discussed concept – “coherence”. The review of method related information, like reviewing vocabularies and phenomena, is also subject to this web of discursive concepts in research education and LIS (Foucault, 1972). The appearance of the review of method information emerges through the operations of these concepts or the relations between them.

7.5 Conclusion of the chapter

To conclude, this chapter has analysed the practices on method information. Method-related information may be classified as research focus, research method/design, research context, research process and result. Each object consists of method information either reviewed or engaged. Specifically, the five subject positions are analysed as the major enunciative modalities in relation to these objects. These subject positions include synthesising subject, summarising subject, comparing subject, evaluating subject, and integrating subject. This study considered the concepts from research education and LIS within these objects and enunciative modalities attached to the practices of method information. It has been identified that concepts such as relevance, coherence, criticality, creativity, and Research as Inquiry are all operating within method-related information practices. Various practices manifesting these concepts are noted, while this study also identified practices insufficiently reflecting these concepts. It is expected that the performance and limitations on the practices of method-related information may inform doctoral education and research students' thesis writing.

Chapter 8

Conclusion

8.0 Introduction

“A PhD has the potential to be never-ending in the sense that the author may be so affected by the dilemmas of doing a doctorate that they do not write, or are unable to finish” (Stanley, 2005, p. 200).

As Stanley (2005) said in his own PhD thesis, the dilemmas of doing a PhD are so all-encompassing that they may drive doctoral students to withdraw from their PhD studies. I encountered several moments of dilemma when the demands of the research project, and personal, family, and societal issues all overwhelmingly converged. Fortunately, in the waning days, I reached this final conclusion, signalling the “ad hoc” ending of this research journey. This chapter recaps this research work to ensure the investigative stages are aligned with the research questions, to consider the implications, limitations, and further possible studies emerging from the present inquiry, and to envisage the philosophy that will guide my life and research in the future.

8.1 Thesis statement

This study has examined seven East Asian PhD students’ information practices as a construct in writing the literature reviews of their social science theses. This examination unfolded through Foucault’s (Foucault, 1972, 1978, 1980; Martin, 1988; Olsson, 2010; Radford & Radford, 2005; Simons & Masschelein, 2010) concept of discourse, which acted as a theoretical and methodological lens through which to examine the works in both Higher Degree Research Education and Library and Information Science on information practices. This investigation of the workings of

information practices has given rise to a working framework to be used to examine the Asian PhD students' research writing, specifically their literature reviews. This study has proposed a topic-based formulation of literature reviews as a final product of this research. This formulation is composed of three aspects. First, a comprehensive literature review should include discursive objects that are relevant to the review of subject vocabularies and topics, research phenomena and variables, and method-related information. Second, a sound literature review requires doctoral students to occupy many and interrelating enunciative positions to speak about the objects in the review. Third, there should be key concepts such as "relevance", "coherence", "criticality", and "creativity" that are operating in the formulation of a literature review as a whole.

This research has offered an alternative perspective from which to perceive the research students' information practices in literature reviews. This new angle prompts research students to ask probing questions about information practices: "what things do I need to include in a literature review?", "how do I write about these things?" and "why do I have to write these things in this way rather than that way?" This overarching perspective of information practices in literature reviews complements and extends the present works on information practices in the areas of research education and LIS.

8.2 Revisiting research questions

The present thesis has examined East Asian PhD students' research writing with respect to their information practices in constructing literature reviews. As such, information practices are brought to the fore as a key construct for writing a literature review. This idea has been formulated by problematising the present solutions in academia to help solve the challenges of academic writing. Writers of research papers, particularly their literature reviews, need to give greater consideration to information practices than writing devices in the present information-explosive age (Fleming-May,

2009). This is even more critical to research students, especially doctoral students using English as an additional language. Asian doctoral students, for example, are regarded as contributors to the exchange of transnational knowledge (Singh, 2010), yet their information practices are less researched in both research education and LIS. In the area of research education, research largely focuses on developing students' writing strategies in terms of familiarising them with writing conventions in various ways (Carter, 2011; Hyland, 2007; McCulloch et al., 2010; Pho, 2008). There are few studies relevant to literature review writing (Boote & Beile, 2005; Bruce, 2001; Holbrook et al., 2007), and little research on literature review writing has been conducted through Foucault's concepts of discourse (1972, 1978, 1980). Likewise, research in LIS mainly addresses students' information searching abilities (Switzer & Lepkowski, 2007) and develops more advanced information searching systems (Kavuluru et al., 2012), while barely touching the heart of information use in writing a literature review. The present study has examined the specific information practices in research writing. Precisely, it offers a form in which information practices pertinent to literature review writing in theses can be named, enunciated, and conceptualised.

This investigation has been addressed through a main research question with three contributory questions, as follows:

Research question:

How can the investigation of information practices provide an alternative perspective towards East Asian PhD students' writing of literature reviews?

Contributory questions:

1. What work in the fields of research education and LIS has been conducted that can be amalgamated to develop a working framework for addressing Asian PhD students' information practices?

2. How do the Asian PhD students address information in literature reviews in light of this working framework?
3. How can these Asian students' information practices as reflected through their literature reviews be reconceptualised through the implications of Foucauldian discourse?

8.2.1 Information practices in the Foucauldian discourse

The first question has been addressed by examining works in the research education and LIS fields. Specifically, the works relevant to information practices include Bruce (2001), Boote and Beile (2005), and Holbrook et al. (2007) in research education and various versions of information literacy frameworks (ACRL, 2000, 2014; Bundy, 2004) in LIS. They were combined to produce a working framework that can be used to examine Asian PhD students' information practices in their literature reviews. This framework has been fashioned according to Foucault (Foucault, 1972; Gunneng, 2006; Kendall & Wickham, 1999) who perceives discourses on information practices to consist of three aspects: objects about information practices, enunciative modalities speaking to these objects, and concepts underneath the practices of information.

This working framework is comprised of two categories of information practices – literature coverage and literature use. Each of these information practices consists of specific objects or elements. Literature coverage is constituted of three aspects, namely the “extent”, “quality”, and “dynamism” of coverage. This study has paid particular attention to the extent of literature coverage. The extent of such coverage can be perceived either subjectively or objectively (Bruce, 2001), while both approaches give rise to several facets to characterise literature coverage. The facets belonging to subjective approach are “breadth”, “relevance”, “exclusion”, and “authority”, while the facets “topicality”, “comprehensiveness”, “currency”, and “availability” belong to the objective approach. Some key elements from these are: breadth, which refers to the inclusion of literature beyond the research topic; topicality, which refers to

literature particularly within the research topic; comprehensiveness, which entails a thorough review of literature relevant to a topic; and currency, which traditionally includes literature within five years of the commencement of a research.

The extent of coverage can be interpreted through the levels of literature coverage (Boote & Beile, 2005). Students can consider the coverage at the field level where various topics or problems within a research field are reviewed; they can seek and include literature at the topic level where a common topic or those similar can be identified from other areas of research; and they can also consider the historic level at which historic literature particularly relevant to the research topic within the research field is included.

This framework consists of three levels of literature use including “literature synthesis”, “literature comparison”, and “literature integration”. These levels generally characterise how the included literature is organised in a literature review. The level of literature synthesis means to synthesise information from different sources; the second level, literature comparison, moves a step further in generating comparative perspectives of the information synthesised, and lastly, literature integration is a level concerning the relationship between the literature and the research in question for the purpose of positioning one’s research project in a wide intellectual context. All these objects and elements in literature coverage and use provide concrete ideas about the constitution of a literature review, and have been examined in the data of the Asian PhD students’ literature reviews.

Within this framework, there are also various enunciative modalities that literature review writers can occupy to address those objects and elements described above. For literature coverage, one such position is that of the apprehending subject, to develop the “working understanding” (Holbrook, et al., 2007) on the literature; another position is the evaluating subject, to critically evaluate the inclusion and exclusion of literature, and/or the consulting subject who confers with others on the coverage of literature.

Regarding literature use, one enunciative modality is that of the synthesising subject, to synthesise different literature into a coherent whole; another is the transcribing subject to transcribe important articulations from scholars. Others are the interpreting subject, to paraphrase and summarise scholars' works, the reflecting subject to consider the relationships between different literature, the creating subject to derive a new perspective through the immersion of the literature reviewed, and the integrating subject, who positions the research in question in the scholarly literature. These subject positions have been specifically examined in the seven Asian PhD students' literature reviews.

Lastly, there are several concepts in this framework that underpin the objects of information practices and their enunciation. These concepts are derived from works in research education and LIS. In research education, the concepts of "relevance", "coherence", "criticality", and "creativity" are operating in the coverage and synthesis of literature. In LIS, relevant concepts are "Scholarship is a Conversation", "Research as Inquiry", and "Authority is Contextual and Constructed". These concepts have been used to examine the Asian PhD students' information practices at the conceptual level.

As implied by Foucault's formations of objects, enunciative modalities, and concepts (1972), the researcher has offered a unique angle from which to perceive information practices in both research education and LIS. This has resulted in the production of a working framework based on these information practices. This framework not only reproduces the "archived" information practices in a systematic way – the objects, the enunciations, and the concepts relevant to information practices – but it can also be used to examine the second research question: How do the Asian PhD students address information in literature reviews according to this working framework?

8.2.2 Interpreting Asian PhD students' information practices

To address the second contributory question, the seven Asian PhD students' literature

reviews have been analysed against this working framework. While these literature reviews were not perfect models, they shed light on the actual information practices which could be incorporated into the existing framework. Specifically, there was a concern with three major parts of a literature review – the review of subject vocabularies and topics, the review of research phenomena and variables, and the review of method-related information. The analysis on each part included an examination of literature coverage and use which was based on but not limited to the working framework.

8.2.2.1 The review of subject vocabularies and topics

The analysis of subject vocabularies and topics includes the examination of three aspects: objects, enunciative positions, and concepts. First, the objects and elements relevant to this part of literature reviews include “topicality”, “breadth”, “currency”, and “comprehensiveness” involved in the coverage of literature (Bruce, 2001), and “content” and “contextual” information in relation to the use of literature.

Specifically, the data showed that both topicality and breadth characterised the Asian PhD students’ literature coverage for reviewing research topics, relevant subject vocabularies or concepts. The ratio between the topicality and breadth of literature varied within the data. This suggests that the review of subject vocabularies was not necessarily limited to the particular topic in question. The scope of literature reviews for subject vocabularies rather depends on the relevance drawn between these vocabularies and the research topic. As such, this study has proposed a “topic-based” approach to the coverage of literature. In a sense, covering the appropriate literature is based on the relations of the major research topic/s with the sub-topics, concepts, or subject vocabularies. There can be a subordinate relationship between the research topic and relevant concepts or subject vocabularies, a contrastive relationship between them, or a contextual relationship, where reviewing certain concepts or subject vocabularies provides a context for the research topic. By considering these various

relations, the literature review writers could identify potential topics, concepts, or subject vocabularies relevant to their research topics, and subsequently realise solid literature coverage.

Other elements of literature coverage such as currency and comprehensiveness should also be noted. For currency, this study has shown that both updated and less updated literature are mixed in each sample when reviewing subject vocabularies and topics. Yet, when including “old” literature (literature outside five years prior to the beginning of a research project) one needs to be more cautious. Research students need to examine the extent to which “old” literature has an impact on the current interpretations of subject terms or is connected with the research problem/s. Comprehensiveness was also identified in some data, though it was not a significant feature in the seven theses. The data suggested that relevance and significance remain priorities to the thorough review of literature about a research topic (Bruce, 2001).

With regard to the objects in literature use, two types of information have been identified – “content information” and “contextual information”. They are not named in the working framework, but are grounded in the data. There are various forms of content and contextual information. Content information can be specific examples or metaphors, theories, and historic information that describe what a subject term or topic is. As to contextual information, there can be general assumptions that give rise to a topic or term, or there is information providing the theoretical or historic background of a topic or term. Content and contextual information do not refer to the nature of particular literature. Rather, they indicate the status of information in relation to a research topic.

The second part of the analysis involved those enunciative modalities that a writer occupies to address the objects and elements on subject vocabularies and topics. One can occupy various enunciative positions in relation to the objects s/he is speaking about (Foucault, 1972).

Virtually any subject position in the working framework can be taken out when reviewing the topics and subject vocabularies. The study has identified some of the subject positions in the data. Basically, reviewing a subject term or topic involves transferring and synthesising the information in the literature. The transferring practices specifically entail one occupying the transcribing and/or interpreting subject positions to vocalise the content and contextual information. Similarly, occupying the position of the synthesising subject either connects different content information sources or contextual information sources, and also concerns the connection between the content and contextual information.

With regard to the concepts operating in the information practices on subject vocabularies and topics, this study has examined the concepts of “relevance”, “coherence”, “criticality”, “creativity”, and “scholarship is a conversation”. These concepts enable one not to review and synthesise literature arbitrarily, but delimit certain rules for information practices to follow. These concepts are operating when one reviews the literature about subject vocabularies and topics. The concept of “relevance” asks a literature review writer to think about various forms of relationships between research topic/s and subject vocabularies; the concept of “coherence” enables one to examine the accuracy of information and contemplate its relation with the research problem; both concepts of “criticality” and “scholarship is a conversation” are concerned with the developmental or controversial interpretations of a topic or subject vocabulary in the literature; and lastly, the concept of “creativity” is about the generation of new perspectives or composite interpretations from the literature about a topic or subject term.

The analysis of concepts has also examined the coexistence (Foucault, 1972; Willig & Stainton-Rogers, 2008) between them. No single concept on information practices emerges alone in characterising a specific part of a literature review. Rather, concepts coexist and support each other by formulating various relations between them

(Foucault, 1972). For example, “coherence” is the subsequent possibility of “relevance” since it is the specific form of relevance; “criticality” and “scholarship is a conversation” are two concepts from different fields, but coexist in a certain degree of analogy and consistency; “creativity” is a subsequent possibility of the concepts of “relevance”, “coherence” and “criticality”. These discursive relations between concepts characterise an enunciative field where literature review writings are formulated. These relations have been found in specific examples in the data. However, they do not exhaust all possible relationships between these concepts. Uncovering these discursive relations in further studies is significant to the understanding of writing a literature review and progressively contributing to research education.

8.2.2.2 The review of research phenomena and variables

In the analysis of research phenomena and variables, the researcher examined a group of objects, enunciative modalities, and concepts. First of all, different objects and elements were found in both the coverage and synthesis of the literature. The key objects relevant to this part of the literature coverage include topicality, breadth, and currency. For example, each literature review sample manifests both the topicality and breadth of literature coverage. However, different from the reviews of subject vocabularies and topics where topicality and breadth are mixed in various ratios, the review for research phenomena and variables is overall more about topicality than breadth. This is relatively easy to perceive since one needs to review the research phenomena particularly related to the research topic or problem in question, and this group of literature is largely within the topic of research.

As to the currency of literature, a large number of less updated references were found when reviewing research phenomena and variables. This raised a concern in Chapter 6 on whether less updated literature could be included for reviewing research phenomena and variables. On the one hand, including outdated literature can be problematic since it is reduced in significance in application to the more current

development of a research problem. Writers therefore need to look for more updated literature to inform their research. This requires better abilities in searching for the most appropriate literature. On the other hand, it could be that “out-of-date” literature is less problematic (seminal work for example). This view can prompt research students to take another angle towards the dated literature. Research students may indiscriminately deny the inclusion of out-of-date literature in their literature reviews. However, it is not the problem of the dated literature itself, but how it is addressed in terms of justifying the significance of out-of-date literature to the present research problem. The discussion opens up further research on this aspect of information practices.

Moreover, there are objects relevant to literature use. They are various types of phenomena found in the data including empirical, metaphorical, and theoretical phenomena. Research phenomena have been categorised according to the degree of abstraction. These have not been specified in the literature reviews, and thus can be incorporated in the present working framework.

With regard to enunciative modality, the study has examined some subject positions in relation to the enunciation of phenomena and variables – the interpreting subject, synthesising subject, reflecting subject, comparing and contrasting subject being examined in the data. The most salient position is that of the synthesising subject in reviewing research phenomena and variables. The synthesising subject position can confer with the comparing and contrasting subject positions to synthesise either a group of consistent or contrastive research phenomena in the literature. Moreover, the synthesising subject, together with the reflecting subject, can synthesise different types of research phenomena. This has been analysed in Chapter 6 where theoretical and empirical phenomena can be combined in a way to shed new light on a research problem.

The present study has also analysed the operation of concepts on phenomena and variables. Once again, the concepts “relevance”, “coherence”, “criticality”, “creativity”, and “scholarship is a conversation” were examined. “Relevance” could be discerned, either subjectively or objectively, when similar research phenomena were compared and contrasted. “Coherence” is a specific form of “relevance” in which the reviews of research phenomena cohere with the focus, hypothesis, or design of a research project. The concepts “criticality” and “scholarship is a conversation” are revealed when the writer embraces different phenomena in the literature on a common research problem. Lastly, “creativity” remains relevant to the review of phenomena and variables. It is manifested when one generates different interpretations of a phenomenon proposed by a study.

8.2.2.3 The review of method-related information

The last part – method-related information – is in response to the second research question. Groups of objects, enunciations, and concepts have been examined in this part of information practices. The objects in the method-related information are not provided in the working framework, but derived from the data analysis. Generally, “research focus”, “research design”, “research context”, and “research process and result” can be included in the review of method-related information. Research focus refers to the aspect/s from which a research problem may be addressed in a study. Information on research design indicates the specific research method or approach (for example, ethnography, the Grounded Theory, longitudinal research, comparative research approach) applied in past studies. Research context refers to presumptive information in terms of the general research background or theoretical underpinnings of a study. Such information provides a basis on which a method may be appropriately used. Lastly, research process refers to the specific practices of how a research is conducted, and research result is the information about the findings of a study. These objects permeate throughout literature reviews. Some are generally reviewed, while some are engaged critically. Research students can either examine the validity of the

research methods used in past studies or draw implications from the studies for their own research designs.

The question of how the objects of method information are treated has invoked the examination of enunciative modalities. Taking “research focus” as an example, in relation to this object, there is a group of subject positions one may occupy. One can be the synthesising subject to combine different research focuses in the literature: the summarising subject to classify various focuses into large groups; the comparing subject who compares and contrasts different groups of research focuses; the evaluating subject who evaluates the significance or appropriateness of a research focus; and lastly the integrating subject who generates the focus/es of research from the review of various focuses in the literature. These subject positions can be invoked in similar ways when speaking about other objects of method-related information. Enunciative modalities such as these enable one not merely to review method-related information in the literature, but to evaluate it or draw a connection with one’s own research.

In relation to these objects and enunciative modes on method-related information, a group of concepts is in operation as well. The concepts “relevance”, “coherence”, “criticality”, “creativity”, and “Research as Inquiry” have been examined. The concept of “relevance” enables one to consider how objects such as research focuses or methods may be relevant to each other; “coherence” further renders this relevant relationship by considering how the objects of method information may be relevant to a research project; the concept of “criticality” entails examination of the appropriateness of research methods or research focuses in relation to the generation of research results in question; “creativity” is concerned with the generation or modification on research methods or focuses as appropriate to a research project; lastly, the concept “Research as Inquiry” regards where a research project is located in a series of research agendas in a field, which requires one to review and interrogate a line of inquiries for generating research questions.

8.2.3 Reconceptualising information practices

The third research question attempts to reconceptualise information practices based on the working framework provided in Chapter 4. This reconceptualisation cannot be achieved without the examination of the doctoral students' literature reviews. Specifically, one can consider "three-tier" questioning to frame the information practices in PhD literature reviews. The three tiers are three preliminary interrogative pronouns – "what", "how", and "why". These respectively correspond to Foucault's (Foucault, 1972; Radford & Radford, 2005) articulations of objects, enunciative modalities, and concepts.

First to consider is the "what" question: what things do I need to include in a literature review? These are the objects relevant to the reviews of subject vocabularies and topics, research phenomena and variables, and method-related information. The literature review writer first needs to "brainstorm" a set of interrelated topics, subject vocabularies, and concepts in relation to the research topic. This is done by considering the various relationships between them. These relations have been discussed in Chapter 5. Based on these topics, subject vocabularies, and concepts, one can locate various literature which can be used in the reviews of subject vocabularies and topics, research phenomena and variables, and method-related information. Each part of a literature review consists of specific objects for consideration. In the review of subject vocabularies and topics, one needs to concern about the content and contextual information. Content information includes examples, metaphors, theories, or histories, and assumptive, theoretical, or historic information is contextual information. In the review of research phenomena and variables are types of information that include empirical, metaphoric, and theoretical descriptions of a phenomenon. Lastly, the review of method-related information involves an examination of research focuses, methods, contexts, processes and results. Identification of these objects prompts research students to think about specific content in a literature review.

In relation to various objects of information practices is a second question – how do I write about these things? This question of “how” is concerned with specific subject positions one occupies to address the objects in the information practices. These subject positions have been demonstrated and exemplified in terms of their uses in both the working framework and the data above. These include but are not limited to the apprehending subject, consulting subject, selecting subject, synthesising subject, summarising subject, creating subject, interpreting subject, transcribing subject, reflecting subject, comparing and contrasting subject, evaluating subject, and integrating subject. In dealing with the information in a literature review, research students can reflect on the specific subject position/s necessary for enunciating specific objects of information practice.

The last question is “why”, viz., why do I have to write these things in this way rather than that way? This question causes one to consider various concepts operating in the information practice. These concepts delimit not only the objects relevant to information practice, but also the modalities of enunciation that speak about these objects (Foucault, 1972). They have been gathered and grouped into the working framework of information practices. Specifically, they include “relevance”, “coherence”, “criticality”, “creativity”, “Scholarship is a Conversation”, “Research as Inquiry”, and “Authority is Constructed and Contextual”. These concepts have not enumerated all concepts relevant to information practices in writing a literature review, though they characterise in part the domain where literature coverage and use can be considered, and the extent to which this performativity is accepted in academia. In this sense, concepts about information practices on the whole are like “reins” that control from afar the information coverage and use in a literature review.

The foregoing three tiers of questions provide thresholds across which research students’ information practices may commence and be reflected upon. The present research has unravelled in part the discourses on information practices. Doing so

informs of various objects that are relevant to information practices. A range of objects indispensable to literature coverage and use are provided. One then needs to be concerned with various modes by which objects in information practices can be enunciated. This study has offered a repertoire of subject positions that can be occupied to speak to specific objects in literature reviews. Lastly, there are concepts for information practices that one needs to reflect upon in covering and using information in a literature review. With questions such as “what things do I need to include in a literature review?”, “how do I write about these things?” and “why do I have to write these things in this way rather than that way?”, one is required to reflect more on writing a literature review and retain to a larger extent the sovereignty of one’s own writing.

This study also has direct implications for supervisors in research education. By contributing to the understanding of research students’ writing of literature review, supervisors can be informed of students’ information practices and provide support accordingly. Moreover, the series of questions structured to consider information practices can itself be a pedagogical tool for supervisors to instruct beginning research students writing their literature review sections.

8.3 Implications for future studies

Some significant issues related to writing a literature review emerged through this study but due to the time limitation, the researcher was unable to further explore them. These issues would be good starting points for future researchers to investigate.

First, this study has examined some important concepts pertinent to information practices. These include “relevance”, “coherence”, “concept”, and “creativity”. It would be meaningful to further examine these concepts in detail. Each concept may give rise to questions which call for in-depth investigation. For example, researchers need to know more about “creativity” in literature reviews in terms of its various forms

and researchers' or students' perspectives of it in thesis writing.

Second, the concept "authority is constructed and contextual" was touched upon but not fully explored in the present study. All literature included in the PhD students' theses was academic articles, which can be assumed authoritative overall in academic communication. Yet, since the PhD students are from different cultural backgrounds, covering and using authoritative literature in their home countries could differ from the context of Australian academic exchange. This raises an inquiry of research students' perceptions of "authority". Specifically, a study may ask about the extent to which cultural difference is a construct to research students' information practices on authority. For understanding authority and the corresponding practices of the Asian students and drawing implications to research education, such inquiry ought to be made in subsequent research agendas.

This study did not examine the power relations between PhD students and their supervisors as a socio-political construct in writing a literature review. Power relations operate in virtually any practice and are in close relation with the performativity and requirements of a practice (Foucault, 1972, 1978; Martin, 1988). The information practices in these PhD students' theses are not foreign to the power relations in academic discourse. However, like many other studies in research education, the present study acknowledges power in shaping students' information practices, whereas deeper analysis of power relations in the construction of information practices has been left for future study.

Fourth, this study has exclusively focused on a part of information practices, while some interrelated practices for writing literature reviews such as information search, information ethics and writing rhetoric have not been significantly touched upon. This study has merely examined the two parts of information practices relevant to a literature review – literature coverage and use. However, information practices are integral, and include literature search, coverage, use, and the ethical use of references.

These information practices also confer with rhetoric – the appropriate use of academic language – which is also pertinent to writing. Past studies have examined information searches and rhetoric individually, while the relations between these different practices in the construction of a writing have not been fully researched. A combined examination on both information practices and rhetoric should be considered in academic writing research, which can be beneficial to many different kinds of student writers. The present study is simply an initiative that calls for researchers to embrace a holistic approach to study writing.

8.4 Final comments

Even though one may make great efforts to prescribe or theorise various practices in life, one can still not disavow the importance of the practices themselves. “Practise makes perfect” remains to be the most simple but inspiring proverb to the knowing of this world. The key attribute of successful thesis writing is not whether one is informed of the objects, enunciation, and concepts extant in the academic discourse. Rather, it is the writing itself. One may reap greater rewards through improved writing practices, and the present study merely offers directions in which practise may be proceed. Another connotation resides in this proverb is ignorance. I first encountered this word from one of my supervisors who drew on Jacques Rancière’s ideas of ignorance in teaching. Later, I was struck by the word “ignorance” from a Pyrrhonian proposition: “we cannot know anything, including the fact that we cannot know anything” (Kendall & Wickham, 1999, p. 10). Although one may consider that the proposition itself is a paradox, it does propose an enduring attitude towards practise. One needs to practise more since knowledge is dynamic and constantly changes over time. The dynamism in things is often beyond individuals’ current knowledge and calls for further investigations and practices to better understand them. As to the present research project, it has enabled me – a student with a Chinese background – to engage in intellectual thinking from a cross-cultural perspective. It does not indicate the end of my research journey, but opens a door for me to access and pursue a fulfilling life-long

learning experience. It prompts me to keep learning by listening more, speaking more, reading more, writing more, and finally thinking more with a humble and ignorant mind.

References

- Abasi, A. R., & Graves, B. (2008). Academic literacy and plagiarism: Conversations with international graduate students and disciplinary professors. *Journal of English for Academic Purposes*, 7(4), 221–233. doi:10.1016/j.jeap.2008.10.010
- Aitchison, C., & Lee, A. (2006). Research writing: Problems and pedagogies. *Teaching in Higher Education*, 11(3), 265–278. doi:10.1080/13562510600680574
- Aitchison, C., Catterall, J., & Ross, P. (2012). “Tough love and tears”: Learning doctoral writing in the sciences. *Higher Education Research & Development*, 31(4), 37–41.
- Aitchison, C., Kamler, B. & Lee, A. (2010). *Publishing pedagogies for the doctorate and beyond*. Oxon: Routledge.
- Amsberry, D. (2010). Deconstructing plagiarism: International students and textual borrowing practices. *The Reference Librarian*, 51(1), 31–44. doi:10.1080/02763870903362183
- Andersen, J. (2006). The public sphere and discursive activities: Information literacy as sociopolitical skills. *Journal of Documentation*, 62(2), 213–228. doi:10.1108/00220410610653307
- Arambewela, R. & Hall, J. (2009). An empirical model of international students satisfaction. *Asia Pacific Journal of Marketing and Logistics*, 21(4), 555–569. <http://dx.doi.org/10.1108/13555850910997599>
- Association of College and Research Libraries. (2000). *Information literacy competency standards for higher education*. Retrieved August 20, 2011 from <http://www.ala.org/acrl/sites/ala.org.acrl/files/content/standards/standards.pdf>
- Association of College and Research Libraries. (2014). *Framework for information literacy for higher education* (Draft 2). Retrieved July 5, 2014 from <http://acrl.ala.org/ilstandards/wp-content/uploads/2014/02/Framework-for-IL-for-HE-Draft-2.pdf>

- Atkinson, P., & Coffey, A. (2011). Analysing documentary realities. In D. Sliverman (Ed.), *Qualitative research: Issues of theory, method and practice* (3rd ed., pp. 77–92). London: SAGE.
- Belkin, N. (1990). The cognitive viewpoint in information science. *Journal of Information Science*, 16, pp. 11-15.
- Berkentotter, C., & Huckin, T. (1995). *Genre knowledge in disciplinary communication: Cognition/culture/power*. Hillsdale, NJ: Lawrence Erlbaum.
- Bernstein, B. (1999). Vertical and horizontal discourse: An essay. *British Journal of Sociology of Education*, 20(2), 157–173.
- Bogdan, R. & Biklen, S. (2009). Foundations of qualitative research in education. In W. Luttrell (Ed.), *Qualitative educational research: Readings in reflexive methodology and transformative practice* (pp. 21-44). New York: Routledge.
- Boote, D., & Beile, P. (2005). Scholars before researchers: On the centrality of the dissertation literature review in research preparation. *Educational Researcher*, 34(6), 3–15. doi:10.3102/0013189X034006003
- Bordonaro, K. (2008). Exploring the connections between information literacy and writing for international students. *Journal of Information Literacy*, 2(2). Retrieved August 20, 2011 from <http://jil.lboro.ac.uk/ojs/index.php/JIL/article/view/RA-V2-I2-2008-1>
- Brew, A., Boud, D., & Namgung, S. (2011). Influences on the formation of academics: The role of the doctorate and structured development opportunities. *Studies in Continuing Education*, 33(1), 51–66. doi:10.1080/0158037X.2010.515575
- Brophy, J., & Bawden, D. (2005). Is Google enough? Comparison of an internet search engine with academic library resources. *Aslib Proceedings*, 57(6), 498–512. doi:10.1108/00012530510634235
- Bruce, C. (1994). Research students' early experiences of the dissertation literature review. *Studies in Higher Education* 19(2), 217-229.

- Bruce, C. (2001). Interpreting the scope of their literature reviews: Significant differences in research students' concerns. *New Library World*, 102(1163/1164), 158–165.
- Bryman, A. (2007). The research question in social research: What is its role? *International Journal of Social Research Methodology*, 10(1), 5–20.
doi:10.1080/13645570600655282
- Bundy, A. (Ed.). (2004). *Australian and New Zealand information literacy framework: Principles, standards, and practice* (2nd ed.). Adelaide: Australian and New Zealand Institute for Information Literacy.
- Burchell, G., Gordon, C., & Miller, P. (Eds.) (1991). *The Foucault effect: Studies in governmentality : With two lectures by and an interview with Michel Foucault*. London: Harvester Wheatsheaf.
- Buschman, J. (2007). Transgression or stasis? Challenging Foucault in LIS theory. *Library Quarterly*, 77(1), 21–44. http://scholarship.shu.edu/lib_pub/66
- Campbell, A. (2010). Developing generic skills and attributes of international students: The (ir)relevance of the Australian university experience. *Journal of Higher Education Policy and Management*, 32(5), 487–497.
doi:10.1080/1360080X.2010.511121
- Can, G., & Walker, A. (2014). Social science doctoral students' needs and preferences for written feedback. *Higher Education*, 68(2), 303–318.
doi:10.1007/s10734-014-9713-5
- Carter, S. (2008). Examining the doctoral thesis: A discussion. *Innovations in Education and Teaching International*, 45(4), 365–374.
doi:10.1080/14703290802377208
- Carter, S. (2011a). Doctorate as genre: Supporting thesis writing across campus. *Higher Education Research & Development*, 30(6), 725–736.
doi:10.1080/07294360.2011.554388
- Carter, S. (2011b). Original knowledge, gender and the word's mythology: Voicing the doctorate. *Arts and Humanities in Higher Education*, 11(4), 406–417.
doi:10.1177/1474022211416555

- Carter, S., & Blumenstein, M. (2011). Thesis structure: Student experience and attempts towards solution. In K. Krause, M. Buckridge, C. Grimmer & S. Purbrick-Illek (Eds.), *Research and Development in Higher Education: Reshaping Higher Education*, 34 (pp. 95-107). Gold Coast: Higher Education Research and Development Society of Australasia.
- Catts, R. & Lau, J. (2008). *Towards information literacy indicators*. Paris: UNESCO. Retrieved December 7, 2011 from <https://dspace.stir.ac.uk/bitstream/1893/2119/1/cattsandlau.pdf>
- Chang, C., & Strauss, P. (2010). "Active agents of change?" Mandarin-speaking students in New Zealand and the thesis writing process. *Language and Education*, 24(5), 415–429. doi:10.1080/09500781003789873
- Charmaz, K. (2006). *Constructing Grounded Theory: A Practical Guide Through Qualitative Analysis*. London: Sage Publication.
- Chen, Y., & Ullen, M. (2011). Helping international students succeed academically through research process and plagiarism workshops. *College & Research Libraries*, 72(3), 209-235.
- Cotterall, S. (2011a). Doctoral students writing: Where's the pedagogy? *Teaching in Higher Education*, 16(4), 413–425. doi:10.1080/13562517.2011.560381
- Cotterall, S. (2011b). Doctoral pedagogy: What do international PhD students in Australia think about it? *Pertanika Journal of Social Science and Humanities*, 19(2), 521–534.
- Creswell, J. (2013). *Qualitative inquiry and research design: choosing among five approaches* (3rd ed.). London: SAGE.
- Day, R., & Lau, A. (2010). Psychoanalysis as critique in the works of Freud, Lacan, and Deleuze and Guattari. In G. Leckie, L. Given & J. Buschman (Eds.), *Critical theory for library and information science: Exploring the social from across the disciplines* (pp. 101-118). California: Libraries Unlimited.
- De la Harpe, B., & David, C. (2012). Major influences on the teaching and assessment of graduate attributes. *Higher Education Research & Development*,

31(4), 493–510. doi:10.1080/07294360.2011.629361

Dervin, B. (1989). Users as research inventions: How research categories. *Journal of Communication*, 39(3), 216–232.

DeSantis, L., & Ugarriza, D. (2000). The concept of theme as used in qualitative nursing research. *Western Journal of Nursing Research*, 22(3), 351–372. doi:10.1177/019394590002200308

Devos, A. (2003). Academic standards, internationalisation, and the discursive construction of “the international student”. *Higher Education Research & Development*, 22(2), 155–166. doi:10.1080/0729436032000083616

Dolby, N., & Rahman, A. (2008). Research in international education. *Review of Educational Research*, 78(3), 676–726. doi:10.3102/0034654308320291

Dreyfus, H. & Rabinow, P. (1983). *Michel Foucault: Beyond structuralism and hermeneutics* (2nd ed.). Chicago: University of Chicago Press.

Durkin, K. (2008). The adaptation of East Asian masters students to western norms of critical thinking and argumentation in the UK. *Intercultural Education*, 19(1), 15–27. doi:10.1080/14675980701852228

Dzung, P. (2008). How can learning about the structure of research articles help international students? In S. Hooker, T. McGrath, J. Cushen, L. Brebner, R. Castle & K. Dorrian (Eds.), *The 19th ISANA International Education Conference* (pp. 1–11). Auckland: ISANA International Education Association.

Elmborg, J. (2006). Critical information literacy: Implications for instructional practice. *The Journal of Academic Librarianship*, 32(2), 192–199.

Ely, M., Vinz, R., Downing, M. & Anzul, M. (1997). *On writing qualitative research*. London: Falmer Press.

Fleming-May, R. (2009). From student to scholar: The academic library and social sciences PhD students’ transformation. *portal: Libraries and the Academy*, 9(2), 199–221. doi:10.1353/pla.0.0040

- Foster, J. (2009). Understanding interaction in information seeking and use as a discourse: A dialogic approach. *Journal of Documentation*, 65(1), 83–105. doi:10.1108/00220410910926130
- Foucault, M. (1971). Orders of discourse. *Social Science Information*, 10(2), 7–30. doi:10.1177/053901847101000201
- Foucault, M. (1972). *The archaeology of knowledge and the discourse on language*. New York: Pantheon Books.
- Foucault, M. (1978). *The history of sexuality, vol. 1: An introduction*. New York: Pantheon Books.
- Foucault, M. (1980). *Power/knowledge: Selected interviews and other writings, 1972-1977*. New York: Pantheon Books.
- Foucault, M. (1986). Kant on enlightenment and revolution. *Economy and Society*, 15(1), 88–96. doi:10.1080/03085148600000016
- Foucault, M. (1994) [1974]. *Dits et écrits vol. II*. (C. O'Farrell, Trans.). Paris: Gallimard. Retrieved August 20, 2013 from <http://www.michel-foucault.com/quote/2004q.html>
- Frohmann, B. (1994). Discourse analysis as a research method in library and information science. *LISR*, 16, 119–138.
- Frohmann, B. (2004). *Deflating information: From science studies to documentation*. Toronto: University of Toronto Press. Retrieved February 20, 2015 from <https://www.google.com.au/search?tbo=p&tbn=bks&q=isbn:0802088392>
- Gee, J. (2005). *An introduction to discourse analysis: Theory and method* (2nd ed.). London: Routledge.
- Gee, J. (2011a). *An introduction to discourse analysis: Theory and method* (3rd ed.). New York: Routledge.
- Gee, J. (2011b). *How to do discourse analysis a toolkit*. New York: Routledge.

- Gee, J. (1993). Critical literacy/socially perceptive literacy: A study of language in action. *The Australian Journal of Language and Literacy*, 16(4), 332–355.
- Gide, E., & Wu, M. (2010). Strategies to teach information technology courses to international students as future global professionals: An Australian case. *Procedia - Social and Behavioral Sciences*, 2(2), 4793–4799. doi:10.1016/j.sbspro.2010.03.772
- Glaser, B. & Strauss, A. (1967). *The discovery of grounded theory*. Chicago: Aldine.
- Gore, J. (1994). Power and pedagogy: Within and beyond the schooling institution. *Annual Conference of Australian Association for Research in Education*. Newcastle, Australia: AARE. Retrieved August 15, 2012 from <http://www.aare.edu.au/data/publications/1994/gorej94076.pdf>
- Gough, D. (2007). Weight of evidence: A framework for the appraisal of the quality and relevance of evidence. *Research Papers in Education*, 22(2), 213–228. doi:10.1080/02671520701296189
- Graham, L. (2007). *Schooling attention deficit hyperactivity disorders: Educational systems of formation and the “behaviourally disordered” school child*. PhD thesis, Queensland University of Technology. Retrieved August 15, 2014, from http://eprints.qut.edu.au/16529/1/Linda_Jayne_Graham_Thesis.pdf
- Green, B. (2005). Unfinished business: Subjectivity and supervision. *Higher Education Research & Development*, 24(2), 151–163. doi:10.1080/07294360500062953
- Green, R. (2010). Information illiteracy: Examining our assumptions. *The Journal of Academic Librarianship*, 36(4), 313–319. doi:10.1016/j.acalib.2010.05.005
- Green, R., & Macauley, P. (2007). Doctoral students’ engagement with information: An American-Australian perspective. *portal: Libraries and the Academy*, 7(3), 317–332. doi:10.1353/pla.2007.0031
- Green, W., Hammer, S., & Star, C. (2009). Facing up to the challenge: Why is it so hard to develop graduate attributes? *Higher Education Research & Development*, 28(1), 17–29. doi:10.1080/07294360802444339

- Guerin, C. (2013). Rhizomatic research cultures, writing groups and academic researcher identities. *International Journal of Doctoral Studies*, 8, 137–150.
- Gunneng, A. (2006). *Discourses and power in sustainable consumption and production debates: An application of Foucault's methodologies*. MPhil thesis, University of Oslo. Retrieved February 28, 2015 from <https://www.duo.uio.no/bitstream/handle/10852/32671/AndreaxMasterxThesis.pdf?sequence=1>
- Guo, S., & Chase, M. (2011). Internationalisation of higher education: Integrating international students into Canadian academic environment. *Teaching in Higher Education*, 16(3), 305–318. doi:10.1080/13562517.2010.546524
- Gupta, S. (1999). *Two texts and I: Disciplines of knowledge and the literary subject*. New Jersey: Associated University Presses. Retrieved February 15, 2015, from <https://books.google.com.au/books?isbn=0838638066>
- Haggis, T. (2009). What have we been thinking of? A critical overview of 40 years of student learning research in higher education. *Studies in Higher Education*, 34(4), 377–390. doi:10.1080/03075070902771903
- Halse, C. (2011). “Becoming a supervisor”: The impact of doctoral supervision on supervisors’ learning. *Studies in Higher Education*, 36(5), 557–570. doi:10.1080/03075079.2011.594593
- Halse, C., & Malfroy, J. (2010). Retheorizing doctoral supervision as professional work. *Studies in Higher Education*, 35(1), 79–92. doi:10.1080/03075070902906798
- Harman, G. (2002). Producing PhD graduates in Australia for the knowledge economy. *Higher Education Research & Development*, 21(2), 179–190. doi:10.1080/0729436022014409
- Harris, E. (1988). *The reality of time: Case studies in argument evaluation*. New York: State University of New York Press. Retrieved March 10, 2015 from <https://books.google.com.au/books?isbn=088706860X>
- Hillocks, G. (2005). The focus on form vs. content in teaching writing. *Research in the Teaching of English*, 40(2), 238–248.

- Hillocks, G. (2010). Teaching argument for critical thinking and writing: An introduction. *English Journal*, 99(6), 24-32.
- Hitchcock, P. (1993). *Dialogics of the oppressed*. Minneapolis: The University of Minnesota Press. Retrieved February 12, 2015 from <https://books.google.com.au/books?isbn=0816621063>
- Holbrook, A. (2007). "Levels" of success in the use of the literature in a doctorate. *South African Journal of Higher Education*, 21(8), 1020–1042. doi:10.4314/sajhe.v21i8.25757
- Holbrook, A., Bourk, S., Lovat, T., & Fairbairn, H. (2008). Consistency and inconsistency in PhD thesis examination. *Australian Journal of Education*, 52(1), 36–48.
- Holbrook, A., Bourke, S., Fairbairn, H., & Lovat, T. (2007). Examiner comment on the literature review in Ph.D. theses. *Studies in Higher Education*, 32(3), 337–356. doi:10.1080/03075070701346899
- Hopwood, N. (2010). A sociocultural view of doctoral students' relationships and agency. *Studies in Continuing Education*, 32(2), 103–117. doi:10.1080/0158037X.2010.487482
- Hughes, C., & Barrie, S. (2010). Influences on the assessment of graduate attributes in higher education. *Assessment & Evaluation in Higher Education*, 35(3), 325–334. doi:10.1080/02602930903221485
- Hughes, H. (2010). International students' experiences of university libraries and librarians. *Australian Academic and Research Libraries*, 41(2), 77-89.
- Hussey, L. (2010). Social capital, symbolic violence, and fields of cultural production: Pierre Bourdieu and library and information science. In G. Leckie, L. Given, & J. Buschman (Eds.), *Critical theory for library and information science: Exploring the social from across the disciplines* (pp. 41-51). California: Libraries Unlimited.
- Hyland, K. (2007). Genre pedagogy: Language, literacy and L2 writing instruction. *Journal of Second Language Writing*, 16(3), 148–164.

doi:10.1016/j.jslw.2007.07.005

Hyland, K., & Tse, P. (2004). Metadiscourse in academic writing: A reappraisal. *Applied Linguistics*, 25(2), 156–177.

Jamali, H. R., Nicholas, D., & Rowlands, I. (2009). Scholarly e-books: The views of 16,000 academics: Results from the JISC national e-book observatory. *Aslib Proceedings*, 61(1), 33–47. doi:10.1108/00012530910932276

Johnston, B., & Webber, S. (2003). Information literacy in higher education: A review and case study. *Studies in Higher Education*, 28(3), 335–352. doi:10.1080/03075070309295

José, M. & Coronel, L. (2006). Technologies of disciplinary power in action: The norm of the “good student”. *Higher Education*, 52(4), 665–686. doi:10.1007/s10734-004-1449-1

Julien, H., & Williamson, K. (2011). Discourse and practice in information literacy and information seeking: Gaps and opportunities. *Information Research*, 16(1). Retrieved March 4, 2012 from <http://www.informationr.net/ir/16-1/paper458.html>

Kamler, B., & Thomson, P. (2004). Driven to abstraction: Doctoral supervision and writing pedagogies. *Teaching in Higher Education*, 9(2), 195–209. doi:10.1080/1356251042000195358

Kamler, B., & Thomson, P. (2008). The failure of dissertation advice books: Toward alternative pedagogies for doctoral writing. *Educational Researcher*, 37(8), 507–514. doi:10.3102/0013189X08327390

Kavuluru, R., Thomas, C., Wang, W., Sheth, A., Chan, V., & Smith, A. (2012). An up-to-date knowledge-based literature search and exploration framework for focused bioscience domains. *IHI '12 Proceedings of the 2nd ACM SIGHIT International Health Informatics Symposium* (pp. 275-284). New York: ACM.

Kell, M., & Gregson, R. (2011). Who struggles with academic literacy? Challenging common assumptions of which students engage in plagiarism. *The University of the Fraser Valley Research Review*, 4(1), 100–110.

- Kelly, F. (2011). "Cooking together disparate things": The role of metaphor in thesis writing. *Innovations in Education and Teaching International*, 48(4), 37–41.
- Kendall, G., & Wickham, G. (1999). *Using Foucault's methods*. Thousand Oaks: SAGE.
- Kim, H. (2011). International graduate students' difficulties: Graduate classes as a community of practices. *Teaching in Higher Education*, 16(3), 281–292. doi:10.1080/13562517.2010.524922
- Ku, H., Lahman, M., Yeh, H., & Cheng, Y. (2008). Into the academy: Preparing and mentoring international doctoral students. *Educational Technology Research and Development*, 56(3), 365–377. doi:10.1007/s11423-007-9083-0
- Kubota, R., & Lehner, A. (2004). Toward critical contrastive rhetoric. *Journal of Second Language Writing*, 13(1), 7–27. doi:10.1016/j.jslw.2004.04.003
- Kuruppu, P., & Gruber, A. (2006). Understanding the information needs of academic scholars in agricultural and biological sciences. *The Journal of Academic Librarianship*, 32(6), 609–623. doi:10.1016/j.acalib.2006.08.001
- Kwan, B., Chan, H., & Lam, C. (2012). Evaluating prior scholarship in literature reviews of research articles: A comparative study of practices in two research paradigms. *English for Specific Purposes*, 31(3), 188–201. doi:10.1016/j.esp.2012.02.003
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. New York: Cambridge University Press.
- Lea, M., & Street, B. (1998). Student writing in higher education: An academic literacies approach. *Studies in Higher Education*, 23(2), 157–172.
- Lea, M. (2004). Academic literacies: A pedagogy for course design. *Studies in Higher Education*, 29(6), 739–756. doi:10.1080/0307507042000287230
- Lea, M., & Jones, S. (2010). Digital literacies in higher education: Exploring textual and technological practice. *Studies in Higher Education*, 36(4), 377–393.

- League of European Research Universities (LEUR). (2010). *Doctoral Degrees Beyond 2010: Training Talented Researchers for Society*. Leuven, Belgium.
- Lee, A., & Boud, D. (2003). Writing groups, change and academic identity: Research development as local practice. *Studies in Higher Education*, 28(2), 187–200. doi:10.1080/0307507032000058109
- Lee, A., & Green, B. (2009). Supervision as metaphor. *Studies in Higher Education*, 34(6), 615–630. doi:10.1080/03075070802597168
- Lee, A., & Kamler, B. (2008). Bringing pedagogy to doctoral publishing. *Teaching in Higher Education*, 13(5), 511–523. doi:10.1080/13562510802334723
- Lemke, J. (1995). *Textual politics: Discourse and social dynamics*. London: Taylor & Francis. Retrieved March 18, 2015 from <https://books.google.com.au/books?isbn=113574825X>
- Liu, G., & Winn, D. 2009. Chinese graduate students and the Canadian Academic Library: A user study at the University of Windsor. *Journal of Academic Librarianship*, 35(6), 565-573. Retrieved May 18, 2012 from <http://scholar.uwindsor.ca/cgi/viewcontent.cgi?article=1005&context=leddylibrarypub>
- Liu, M. (1993). Progress in documentation the complexities of citation practice: A review of citation studies. *Journal of Documentation*, 49(4), 370-408.
- Lovitts, B. (2008). The transition to independent research: Who makes it, who doesn't, and why. *The Journal of Higher Education*, 79(3), 296–325. doi:10.1353/jhe.0.0006
- Maher, D., Seaton, L., McMullen, C., Fitzgerald, T., Otsuji, E., & Lee, A. (2008). “Becoming and being writers”: The experiences of doctoral students in writing groups. *Studies in Continuing Education*, 30(3), 263–275. doi:10.1080/01580370802439870
- Maher, M., Feldon, D., Timmerman, B., & Chao, J. (2013). Faculty perceptions of common challenges encountered by novice doctoral writers. *Higher Education Research & Development*, 33(4), 699–711. doi:10.1080/07294360.2013.863850

- Malcolm, C. (2013). *The social work dissertation: Using small-scale qualitative methodology* (2nd ed.). New York: Open University Press.
- Martin, L. et al. (1988). *Technologies of the self: A seminar with Michel Foucault*. London: Tavistock. Retrieved February 28, 2012 from <http://foucault.info/documents/foucault.technologiesOfSelf.en.html>
- McCann, T. (2010). Gateways to writing logical arguments. *English Journal*, 99(6), 33–39.
- McCulloch, A., Bastalich, W., Behrend, M., Bloomfield, R., Ford, J., & Loeser, C. (2010). Communicating research: Audience, academics and research students. In M. Kiley (Ed.), *Proceedings of Quality in Postgraduate Research Conference* (pp. 207-216). Adelaide: The Australian National University.
- Mewburn, I. (2011). Troubling talk: Assembling the PhD candidate. *Studies in Continuing Education*, 33(3), 321–332. doi:10.1080/0158037X.2011.585151
- Middleton, S. (2007). The place of theory: Locating the New Zealand “education” Ph.D. experience, 1948–1998. *British Journal of Sociology of Education*, 28(1), 69–87. doi:10.1080/01425690600996691
- Miller, L. (2008). Foucauldian constructionism. In J. Gubrium (Ed.), *Handbook of constructionist research* (pp. 251-274). New York: Guilford Press.
- Mu, C. (2007). Marketing academic library resources and information services to international students from Asia. *Marketing Information Services*, 35(4), pp. 571-583. doi:10.1108/00907320710838390
- Mullins, G., & Kiley, M. (2010). “It’s a PhD, not a Nobel Prize”: How experienced examiners assess research theses. *Studies in Higher Education*, 27(4), 369-386. doi:10.1080/0307507022000
- Nascimento, D., & Marteleto, R. (2008). Social field, domains of knowledge and informational practice. *Journal of Documentation*, 64(3), 397–412. doi:10.1108/00220410810867605
- Nicholas, D., Huntington, P., Jamali, H., Rowlands, I., & Fieldhouse, M. (2009). Student digital information-seeking behaviour in context. *Journal of*

Documentation, 65(1), 106–132. doi:10.1108/00220410910926149

Nikander, P. (2008). Constructionism and discourse analysis. In J. F. Gubrium (Ed.), *Handbook of constructionist research* (pp. pp. 413–428). New York: Guilford Press.

Nulty, D., Kiley, M., & Meyers, N. (2009). Promoting and recognising excellence in the supervision of research students: An evidence-based framework. *Assessment & Evaluation in Higher Education*, 34(6), 693–707.
doi:10.1080/02602930802474193

Olsson, M. R. (2010). Michel Foucault: Discourse, power/knowledge, and the battle for truth. In G. Leckie, L. Given, and J. Buschman (Eds.), *Critical theory for library and information science: Exploring the social from across the disciplines* (pp. 63–74). California: Libraries Unlimited.

Owusu-Ansah, E. (2007). Beyond collaboration: Seeking greater scope and centrality for library instruction. *portal: Libraries and the Academy*, 7(4), 415–429.
doi:10.1353/pla.2007.0043

Paltridge, B., & Starfield, S. (2007). *Thesis and dissertation writing in a second language: A handbook for supervisors*. New York: Routledge.

Parker, I. (1992). *Discourse dynamics: Critical analysis for social and individual psychology*. London: Routledge.

Pawley, C. (2012). Information literacy: A contradictory coupling. *The Library Quarterly*, 73(4) 422–452.

Phillips, N., & Hardy, C. (Eds.). (2002). *Discourse Analysis*. Thousand Oaks, CA: SAGE Publications, Inc. doi: <http://dx.doi.org/10.4135/9781412983921>

Pho, P. (2008). How can learning about the structure of research articles help international students? *Proceedings of the nineteenth international conference of ISANA*. Auckland: ISANA International Education Association.

Pitman, T., & Broomhall, S. (2009). Australian universities, generic skills and lifelong learning. *International Journal of Lifelong Education*, 28(4), 439–458.
doi:10.1080/02601370903031280

- Potter, J., & Hepburn, A. (2008). Discursive constructionism. In J. Gubrium (Ed.), *Handbook of constructionist research* (pp. 275–293). New York: Guilford Press.
- Powers, P. (2001). *The methodology of discourse analysis*. London: Jones and Bartlett Publishers. Retrieved February 10, 2015 from <https://books.google.com.au/books?isbn=0763718041>
- Prior, L. (2011). Using documents in social research. In D. Silverman (Ed.), *Qualitative research: Issues of theory, method and practice* (3rd ed., pp. 93–110). London: SAGE.
- Radford, G., & Radford, M. (2005). Structuralism, post-structuralism, and the library: de Saussure and Foucault. *Journal of Documentation*, 61(1), 60–78. doi:10.1108/00220410510578014
- Reckwitz, A. (2002). Toward a theory of social practices: A development in culturalist theorizing. *European Journal of Social Theory*, 5(2), 243–263. doi:10.1177/13684310222225432
- Research Information Network (2008). *Mind the Skills Gap: Information Handling Training for Researchers. A report commissioned by the Research Information Network*. London: Research Information Network. Retrieved August 30, 2011 from <http://www.rin.ac.uk/system/files/attachments/Mind-skills-gap-report.pdf>
- Riedler, M. & Eryaman, M. (2010). Transformative library pedagogy and community-based libraries: A Freirean perspective. In G. Leckie, L. Given, & J. Buschman (Eds.), *Critical theory for library and information science: Exploring the social from across the disciplines* (pp. 89-99). California: Libraries Unlimited.
- Roan, B. (2013). *The complexity of architecture: An analysis of design intentions and theories in the Norwegian national tourist routes*. MPhil thesis, University of Oslo. Retrieved March 10, 2015 from https://www.duo.uio.no/bitstream/handle/10852/35957/Beck_Roan_Thesis_The_Complexity_of_Architecture%5b1%5d.pdf?sequence=1&isAllowed=y
- Rowlands, I., & Nicholas, D. (2006). The changing scholarly communication landscape: An international survey of senior researchers. *Learned Publishing*,

19, 31-55.

Saldana, J. (2009). *The coding manual for qualitative researchers*. London: SAGE.

Schon, D. (1995). The new scholarship requires a new epistemology. *Change*, 27(6), 26-34.

Shah, M., Nair, S., & Wilson, M. (2011). Quality assurance in Australian higher education: Historical and future development. *Asia Pacific Education Review*, 12(3), 475–483. doi:10.1007/s12564-011-9152-2

Shanbhag, S. (2007). Door-in-the-face: Understandings of scholarship for academic instruction librarians. *Library Philosophy and Practice (e-journal)*, (June). Retrieved September 20, 2011 from <http://digitalcommons.unl.edu/libphilprac/137>

Sharmini, S., Spronken-Smith, R., Golding, C., & Harland, T. (2014). Assessing the doctoral thesis when it includes published work. *Assessment & Evaluation in Higher Education*, 40(1), 89–102. doi:10.1080/02602938.2014.888535

Silverman, D. (2010). *Doing qualitative research: A practical handbook* (3rd ed.). London: SAGE Ltd.

Silverman, D. (2011). *Interpreting qualitative data: A guide to the principles of qualitative research* (4th ed.). London: SAGE.

Simmons, M. (2005). Librarians as disciplinary discourse mediators: Using genre theory to move toward critical information literacy. *portal: Libraries and the Academy*, 5(3), 297–311. doi:10.1353/pla.2005.0041

Simons, M., & Masschelein, J. (2010). Governmental, political and pedagogic subjectivation: Foucault with Rancière. *Educational Philosophy and Theory*, 42(5-6), 588–605. doi:10.1111/j.1469-5812.2010.00687.x

Singh, M. (2010). Connecting intellectual projects in China and Australia: Bradley's international student-migrants, Bourdieu and productive ignorance. *Australian Journal of Education*, 54(1), 31-45.

- Stahl, B. (2004). Whose discourse? A comparison of the Foucauldian and Habermasian concepts of discourse in critical IS research. *Proceedings of the Tenth Americas Conference on Information Systems* (pp. 4329-4336). New York.
- Stanley, S. (2004). *Doctoral dilemmas: Towards a discursive psychology of postgraduate education*. PhD thesis, Loughborough University. Retrieved August 21, 2013 from <http://www.cardiff.ac.uk/socsi/resources/DoctoralDilemmasB.pdf>
- Starks, H., & Trinidad, S. (2007). Choose your method: A comparison of phenomenology, discourse analysis, and grounded theory. *Qualitative Health Research*, 17(10), 1372–80. doi:10.1177/1049732307307031
- Strauss, P. (2012). “The English is not the same”: Challenges in thesis writing for second language speakers of English. *Teaching in Higher Education*, 17(3), 283–293. doi:10.1080/13562517.2011.611871
- Suri, H., & Clarke, D. (2009). Advancements in research synthesis methods: From a methodologically inclusive perspective. *Review of Educational Research*, 79(1), 395–430. doi:10.3102/0034654308326349
- Swales, J., & Leeder, C. (2012). A reception study of the articles published in English for specific purposes from 1990–1999. *English for Specific Purposes*, 31(2), 137–146. doi:10.1016/j.esp.2011.07.003
- Switzer, A. & Lepkowski, F. (2007). Information literacy and the returning Masters student: Observations from the library side. In R. Carlsen et al. (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2007* (pp. 1343-1348). Chesapeake: Association for the Advancement of Computing in Education (AACE). Retrieved April 12, 2012 from <http://www.editlib.org/p/24749>
- Switzer, A., & Perdue, S. (2011). Dissertation 101: A research and writing intervention for education graduate students. *Education Libraries*, 34(1), 4-14.
- Talja, S. (1999). Analyzing qualitative interview data: The discourse analytic method. *Library & Information Science Research*, 21(4), 459-477. doi:10.1016/S0740-8188(99)00024-9

- Tardy, C. (2005). "It's like a story": Rhetorical knowledge development in advanced academic literacy. *Journal of English for Academic Purposes*, 4(4), 325-338.
- Thornley, C., & Gibb, F. (2009). Meaning in philosophy and meaning in information retrieval (IR). *Journal of Documentation*, 65(1), 133–150.
doi:10.1108/00220410910926158
- Townsend, L., Brunetti, K., & Hofer, A. (2011). Threshold concepts and information literacy. *portal: Libraries and the Academy*, 11(3), 853-869.
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, 14(3), 207–222. doi:10.1111/1467-8551.00375
- University of Western Sydney. (2011). Doctorate policy. Retrieved February 5, 2011 from <http://policies.uws.edu.au/view.current.php?id=00017>
- Velautham, L., & Picard, M. (2010). Reshaping HDR supervisor writing advice through unpacking discourses. In M. Devlin, J. Nagy & A. Lichtenberg (Eds.) *Research and Development in Higher Education: Reshaping Higher Education*, 33, 621-632. Melbourne, 6-9 July, 2010.
- Wang, Y. (2007). Riding to the future – An investigation of information literacy skills of students at an urban university as applied to the web environment. *International Journal on ELearning*, 6(4), 593-603.
- Wass, R., Harland, T., & Mercer, A. (2011). Scaffolding critical thinking in the zone of proximal development. *Higher Education Research & Development*, 30(3), 317–328. doi:10.1080/07294360.2010.489237
- Weiner, J. (2011). Is there a difference between critical thinking and information literacy? A systematic review 2000-2009. *Journal of Information Literacy*, 5(2), 81-92. Retrieved January 23, 2013 from <http://dx.doi.org/10.11645/5.2.1600>
- Willcocks, L., & Mingers, J. (2004). *Social theory and philosophy for information systems* (John Wiley series in information systems). Chichester: Wiley.
- Willig, C., & Stainton-Rogers, W. (Eds.). (2008). *The SAGE handbook of qualitative*

research in psychology. London: SAGE. doi:
<http://dx.doi.org/10.4135/9781848607927>

Zurkowski, P. 1974. *The information service environment: Relationships and priorities* (Report ED 100391). Washington: National Commission on Libraries and Information Science.

APPENDIX I

Framework for Information Literacy for Higher Education, 2nd draft (ACRL, 2014)

The Six Frames

Scholarship is a Conversation

Scholarship is a conversation refers to the idea of sustained discourse within a community of scholars or thinkers, with new insights and discoveries occurring over time as a result of competing perspectives and interpretations.

While many questions can be answered by appeal to a single, authoritative source--the capital of a country or the atomic number of an element, for example--scholarly research resists simple answers. Rather, scholarship is discursive practice in which ideas are formulated, debated, and weighed against one another over extended periods of time. Instead of seeking discrete answers to complex problems, scholars understand that a given issue may be characterized by several competing perspectives. Far from a unified body of uncontested knowledge, the scholarly record is better understood in terms of a conversation in which information users and creators come together to negotiate meaning, with the expert adding his or her voice to the conversation. The expert understands that there may not be a single uncontested answer to a query and, hence, is inclined to seek out the many perspectives in a scholarly conversation, not merely the one with which the expert already agrees.

Knowledge Practices (Abilities)

Learners who are developing their information literate abilities:

- Identify the contribution that particular articles, books, and other scholarly pieces make to disciplinary knowledge.
- Summarize the changes in scholarly perspective over time on a particular topic within a specific discipline.
- Contribute to scholarly conversation at an appropriate level (local online community, guided discussion, undergraduate research journal, conference presentation/poster session).
- Predict that a given scholarly work may not represent the only--or even the majority--perspective on the issue at hand.
- Critically evaluate contributions made by others in participatory information environments.
- Recognize that they are often entering into the midst of a scholarly conversation, not a finished conversation.

Dispositions

Learners who are developing their information literate abilities:

- Seek out conversations that are taking place in their area of research.
- Suspend judgment on the value of a particular piece of scholarship until the larger context for the scholarly conversation is better understood.
- Recognize that scholarly conversations take place in a variety of venues.
- Value user-generated content and critically evaluate contributions made by others.
- See themselves as contributors to scholarship rather than only consumers of it.
- Understand the responsibility that comes with entering the conversation through participatory channels.

Research as Inquiry

Research as Inquiry refers to an understanding that research is iterative and depends upon asking increasingly complex questions whose answers develop new questions or lines of inquiry in any field.

Experts see inquiry as a process that focuses on problems or questions in a discipline or between disciplines that are open or unresolved. Experts recognize the collaborative effort within a discipline to extend the knowledge in that field by developing a knowledge base of lines of inquiry, research methodologies, and best practices for conducting research. Many times, this process includes points of disagreement where debate and dialog work to deepen the conversations around knowledge. This process of inquiry extends beyond the academic world to include instances such as evidence and data collected by groups and individuals in communities and the public at large, and the process of inquiry may also focus upon personal, professional, or societal needs. The spectrum of inquiry thus encompasses processes of basic recapitulation of knowledge and data, by the novice, through increasing stages of greater understanding of a discipline or exchanges between disciplines, among more experienced researchers. The novice works to understand foundational ideas, methods, and over time develops the corresponding ability to formulate more advanced research questions and employ a greater repertoire of investigative methods.

Knowledge Practices (Abilities)

Learners who are developing their information literate abilities:

- Conduct research through the lens of inquiry in order to enhance the impact of their work.
- Provide evidence of understanding that methods of research leading to new knowledge creation vary by need, circumstance, and type of inquiry.
- Formulate questions for research based on gaps in information or data available.
- Communicate effectively with collaborators in shared spaces and learn from multiple points of view.
- Engage in informed, self-directed learning that encourages a broader worldview through the global reach of today's information technology.

Dispositions

Learners who are developing their information literate abilities:

- Value persistence, adaptability, and flexibility, and recognize that ambiguity can be beneficial.
- Seek opportunities to transform current research-related practices in order to conduct more authentic research.
- Practice thinking critically when confronting new learning, where lack of familiarity with new methods and approaches requires additional effort.
- Value intellectual curiosity in developing questions and learning new investigative methods.
- Recognize that learning is a process and that reflecting on errors or mistakes leads to new insights and discoveries.

Authority is Constructed and Contextual

Authority of information resources depends upon the resources' origins, the information need, and the context in which the information will be used. This authority is viewed with an attitude of informed skepticism and an openness to new perspectives, additional voices, and changes in schools of thought.

Experts understand that authority is the degree of trust that is bestowed and as such, authority is both contextual and constructed. It is contextual in that the information need may help determine the level of authority required. For instance, getting a weather forecast before going on a picnic does not require the foremost meteorological authority while a dissertation on the latest weather models may. It is constructed in that various communities may recognize different types of authority. For instance, a religious community may recognize the authority of religious leaders and texts which may not be as highly regarded by others who are not part of the community. Scholars within a discipline may value specific publications or publishers over others. Allowing that some kinds of expertise are more worthy than others can result in privileging certain sources of information unduly.

An understanding of this concept enables learners to critically examine all evidence – be it a Wikipedia article or a peer-reviewed conference proceeding – and ask relevant questions about origins, context, and suitability for the information need of the moment. Thus, the learner both respects the expertise that authority represents, while remaining skeptical of both the systems which have elevated that authority and the information created by it. The experienced researcher knows how to seek authoritative voices, but also recognizes that unlikely voices can be authoritative, depending on need. The novice researcher may need to rely on superficial indicators of authority such as type of publication or author credentials where experts recognize schools of thought or discipline-specific paradigms.

Knowledge Practices (Abilities)

Learners who are developing their information literate abilities:

- Determine how authoritative information should be for a particular need.
- Identify markers of authority when engaging with information, understanding the elements that might temper that authority.
- Understand that many disciplines have acknowledged authorities in the sense of well known scholars and publications that are widely considered "standard," and yet even in those situations, some scholars would challenge the authority of those sources.
- Recognize that authoritative content may be packaged formally or informally, and may include dynamic user-generated information.
- Acknowledge that they themselves may be seen, now or in the future, as authorities in a particular area, and recognize the responsibilities that entails.
- Evaluate user response as an active researcher, understanding the differing natures of feedback mechanisms and context in traditional and social media platforms.

Dispositions

Learners who are developing their information literate abilities are:

- Inclined to develop and maintain an open mind when encountering varied and sometimes conflicting perspectives.
- Motivated to find authoritative sources, recognizing that authority may be conferred or manifested in unexpected ways.
- Aware of the importance of assessing content critically to the best of their ability.
- Recognize that there are potential problems with traditional notions of granting authority.
- Conscious that maintaining these attitudes and actions requires frequent self monitoring.

Format as a Process

Format is the way tangible knowledge is disseminated. The essential characteristic of format is the underlying process of information creation, production, and dissemination, rather than how the content is delivered or experienced.

A print source is characterized by its physical structure (e.g., binding, size, number of pages) as well as its intellectual structure (e.g., table of contents, index, references). A digital source is characterized by its presentation, intellectual structure and physical structure (e.g., file format). In many cases, the way that information is presented online obscures not just the format, but also the processes of creation and production that need to be understood in order to evaluate the source fully. Understanding what distinguishes one format from another and why it matters requires a thorough knowledge of the information and research cycles, scholarly communication, and

common publishing practices, especially for those who have never experienced the print version of formats.

The expert understands that the quality and usefulness of a given piece of information is determined by the processes that went into making it. The processes of researching, writing, editing, and publishing information--whether print or digital--can be highly divergent, and information quality reflects these differences. From tweets to magazines to scholarly articles, the unique capabilities and constraints of each format determines how information can and should be used. The expert learns that the instant publishing found in social media often comes at the cost of accuracy, while the thorough editorial process of a book often comes at the cost of currency. Whatever form information takes, the expert looks to the underlying processes of creation as well as the final product in order to critically evaluate that information for use as evidence.

Knowledge Practices (Abilities)

Learners who are developing their information literate abilities:

- Understand that format and method of access are separate entities.
- Recognize that different creation processes result in the presence of distinct attributes.
- Articulate the purposes of various formats, as well as their distinguishing characteristics.
- Identify which formats best meet particular information needs.
- Decide which format and mode of transmission to use when disseminating their own creations of information.
- Transfer knowledge to new formats in unpredictable and evolving environments.

Dispositions

Learners who are developing their information literate abilities:

- Are inclined to seek out markers for information sources that indicate the underlying creation process.
- Identify the most effective format in seeking information.
- Understand that different formats of information dissemination with different impacts are available for their use.

Searching as Exploration

Locating information requires a combination of inquiry, discovery, and serendipity. There is no one size fits all source to find the needed information. Information discovery is nonlinear and iterative, requiring the use of a broad range of information sources and flexibility to pursue alternate avenues as new understanding is developed.

The search for information is ignited by inquiry, the pursuit of which is rarely linear and requires the knowledge and use of a range of source types. It is also a process of

discovery, and experts realize that methods employed may be fluid and that any element (including inquiry) of an overall approach can change based on increased understanding of a subject; discovering one source can lead to other sources or avenues of inquiry. Experts also recognize that there are boundaries for research, such as the context of the initial inquiry and time available to pursue it, and that part of the process is determining project scope based on these boundaries.

A novice researcher may rely on one or two familiar resources while an expert surveys the breadth of information sources to determine where to best obtain the information sought within the project scope. These sources include more than Internet resources, databases, social media, books, journals, etc. They include the knowledge, observations and expertise of people as well. For example, it may become necessary to conduct a formal interview or stop somewhere to ask for directions. Experts use resources that make the most contextual sense to satisfy an inquiry ethically.

Further, effective use of selected resources is predicated on understanding them. Just as understanding how a system is constructed and works will empower the expert to uncover more relevant results, an understanding of people and effective communication can enable access to their knowledge. The very best interviewers are more effective at teasing out details than beginners, for example. Experts will also spend time learning about their selected resource to better understand it and access needed information as different resources require different methods of access.

Knowledge Practices (Abilities)

Learners who are developing their information literate abilities:

- Determine the scope of the question or task required to meet one's needs.
- Identify interested parties that might produce information about a topic and how that information might be accessed.
- Demonstrate the importance of matching information needs and search strategies to appropriate search tools.
- Recognize that some tools may be searched using both basic and advanced strategies, and understand the potential of each.
- Are inclined to discover citation management and sharing features, moving them from searching for information to information management strategies.

Dispositions

Learners who are developing their information literate abilities:

- Show through their searching that they value persistence, adaptability, and flexibility.
- Understand that first attempts at searching don't always pay off.
- Are willing to analyze needs at the beginning of information searches.
- Recognize the value of browsing and other serendipitous methods of information gathering.
- Reevaluate needs and next steps throughout the search process.

Information has Value

Information has Value acknowledges that the creation of information and products derived from information requires a commitment of time, original thought, and resources that need to be respected by those seeking to use these products, or create their own based on the work of others. In addition, information may be valued more or less highly based on its creator, its audience/consumer, or its message.

Experts understand that this value designates information as intellectual property, and therefore, recognizes three important dimensions of value. First, information can act as a commodity, and as such, creators can use their work for financial, reputational, social, or civic gains. These motivations may determine how information sources are shared whether given freely, offered for sale, or leased for temporary access. Information users have responsibilities as both consumers and creators of information based on the work of others. Academic and legal practices such as proper attribution of sources and complying with copyright are a result.

Second, as intellectual property, information sources are affected by economic, sociological, and political influences. The means of production may privilege some voices over others. Some search systems may privilege some sources over others due to economic incentive. Experts understand the consequences of selecting appropriate research methods (such as applying the correct statistical analysis to data), the limitations of publishing practices (such as scholarly journals' lack of interest in publishing negative research results), and the boundaries to accessing the information ecosystem (such as populations without internet access or obstacles created by paywalls).

Finally, experts recognize that their online activity and information they contribute to online sites can be used for economic gain by the sites themselves. Such uses may include personal information harvested from social media sites or advertisements placed on "free" web tools or apps. One's online presence is monitored, tracked and, ultimately, monetized.

Knowledge Practices (Abilities)

Learners who are developing their information literate abilities:

- Give credit to the original ideas of others through proper attribution and citation.
- Recognize the meaning of intellectual property in the United States.
- Understand that intellectual property is a social construct that varies by culture.
- Articulate the purpose and distinguishing characteristics of copyright, open access, and public domain.
- Know how to find open access materials.

- Differentiate between the production of original information and remixing or re-purposing open resources.
- Manage their online presences responsibly.
- Decide where their information, as knowledge creator, should be published.

Dispositions

Learners who are developing their information literate abilities:

- Respect the original ideas of others and the academic tradition of citation and attribution.
- Value the creative skills needed to produce information.
- See themselves as contributors to the information marketplace rather than only consumers of it.
- Recognize issues of access or lack of access to information sources.
- Understand that some individuals or groups of individuals may not be represented within the information ecosystem.

APPENDIX II

Information Literacy Competency Standards for Higher Education (ACRL, 2000)

Standard One

The information literate student determines the nature and extent of the information needed.

Performance Indicators:

1. The information literate student defines and articulates the need for information.

Outcomes Include:

- a. Confers with instructors and participates in class discussions, peer workgroups, and electronic discussions to identify a research topic, or other information need
- b. Develops a thesis statement and formulates questions based on the information need
- c. Explores general information sources to increase familiarity with the topic
- d. Defines or modifies the information need to achieve a manageable focus
- e. Identifies key concepts and terms that describe the information need
- f. Recognizes that existing information can be combined with original thought, experimentation, and/or analysis to produce new information

2. The information literate student identifies a variety of types and formats of potential sources for information.

Outcomes Include:

- a. Knows how information is formally and informally produced, organized, and disseminated
- b. Recognizes that knowledge can be organized into disciplines that influence the way information is accessed
- c. Identifies the value and differences of potential resources in a variety of formats (e.g., multimedia, database, website, data set, audio/visual, book)
- d. Identifies the purpose and audience of potential resources (e.g., popular vs. scholarly, current vs. historical)
- e. Differentiates between primary and secondary sources, recognizing how their use and importance vary with each discipline
- f. Realizes that information may need to be constructed with raw data from primary sources

3. The information literate student considers the costs and benefits of acquiring the needed information.

Outcomes Include:

- a. Determines the availability of needed information and makes decisions on broadening the information seeking process beyond local resources (e.g., interlibrary loan; using resources at other locations; obtaining images, videos, text, or sound)
- b. Considers the feasibility of acquiring a new language or skill (e.g., foreign or discipline-based) in order to gather needed information and to understand its context
- c. Defines a realistic overall plan and timeline to acquire the needed information

4. The information literate student reevaluates the nature and extent of the information need.

Outcomes Include:

- a. Reviews the initial information need to clarify, revise, or refine the question
- b. Describes criteria used to make information decisions and choices

Standard Two

The information literate student accesses needed information effectively and efficiently.

Performance Indicators:

1. The information literate student selects the most appropriate investigative methods or information retrieval systems for accessing the needed information.

Outcomes Include:

- a. Identifies appropriate investigative methods (e.g., laboratory experiment, simulation, fieldwork)
- b. Investigates benefits and applicability of various investigative methods
- c. Investigates the scope, content, and organization of information retrieval systems
- d. Selects efficient and effective approaches for accessing the information needed from the investigative method or information retrieval system

2. The information literate student constructs and implements effectively designed search strategies.

Outcomes Include:

- a. Develops a research plan appropriate to the investigative method
- b. Identifies keywords, synonyms and related terms for the information needed
- c. Selects controlled vocabulary specific to the discipline or information retrieval source
- d. Constructs a search strategy using appropriate commands for the information retrieval system selected (e.g., Boolean operators, truncation, and proximity for search engines; internal organizers such as indexes for books)
- e. Implements the search strategy in various information retrieval systems using different user interfaces and search engines, with different command languages,

protocols, and search parameters

f. Implements the search using investigative protocols appropriate to the discipline

3. The information literate student retrieves information online or in person using a variety of methods.

Outcomes Include:

- a. Uses various search systems to retrieve information in a variety of formats
- b. Uses various classification schemes and other systems (e.g., call number systems or indexes) to locate information resources within the library or to identify specific sites for physical exploration
- c. Uses specialized online or in person services available at the institution to retrieve information needed (e.g., interlibrary loan/document delivery, professional associations, institutional research offices, community resources, experts and practitioners)
- d. Uses surveys, letters, interviews, and other forms of inquiry to retrieve primary information

4. The information literate student refines the search strategy if necessary.

Outcomes Include:

- a. Assesses the quantity, quality, and relevance of the search results to determine whether alternative information retrieval systems or investigative methods should be utilized
- b. Identifies gaps in the information retrieved and determines if the search strategy should be revised
- c. Repeats the search using the revised strategy as necessary

5. The information literate student extracts, records, and manages the information and its sources.

Outcomes Include:

- a. Selects among various technologies the most appropriate one for the task of extracting the needed information (e.g., copy/paste software functions, photocopier, scanner, audio/visual equipment, or exploratory instruments)
- b. Creates a system for organizing the information
- c. Differentiates between the types of sources cited and understands the elements and correct syntax of a citation for a wide range of resources
- d. Records all pertinent citation information for future reference
- e. Uses various technologies to manage the information selected and organized

Standard Three

The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.

Performance Indicators:

1. The information literate student summarizes the main ideas to be extracted from the information gathered.

Outcomes Include:

- a. Reads the text and selects main ideas
 - b. Restates textual concepts in his/her own words and selects data accurately
 - c. Identifies verbatim material that can be then appropriately quoted
2. The information literate student articulates and applies initial criteria for evaluating both the information and its sources.

Outcomes Include:

- a. Examines and compares information from various sources in order to evaluate reliability, validity, accuracy, authority, timeliness, and point of view or bias
 - b. Analyzes the structure and logic of supporting arguments or methods
 - c. Recognizes prejudice, deception, or manipulation
 - d. Recognizes the cultural, physical, or other context within which the information was created and understands the impact of context on interpreting the information
3. The information literate student synthesizes main ideas to construct new concepts.

Outcomes Include:

- a. Recognizes interrelationships among concepts and combines them into potentially useful primary statements with supporting evidence
 - b. Extends initial synthesis, when possible, at a higher level of abstraction to construct new hypotheses that may require additional information
 - c. Utilizes computer and other technologies (e.g. spreadsheets, databases, multimedia, and audio or visual equipment) for studying the interaction of ideas and other phenomena
4. The information literate student compares new knowledge with prior knowledge to determine the value added, contradictions, or other unique characteristics of the information.

Outcomes Include:

- a. Determines whether information satisfies the research or other information need
- b. Uses consciously selected criteria to determine whether the information contradicts or verifies information used from other sources
- c. Draws conclusions based upon information gathered
- d. Tests theories with discipline-appropriate techniques (e.g., simulators, experiments)
- e. Determines probable accuracy by questioning the source of the data, the limitations of the information gathering tools or strategies, and the reasonableness of the

conclusions

- f. Integrates new information with previous information or knowledge
- g. Selects information that provides evidence for the topic

5. The information literate student determines whether the new knowledge has an impact on the individual's value system and takes steps to reconcile differences.

Outcomes Include:

- a. Investigates differing viewpoints encountered in the literature
- b. Determines whether to incorporate or reject viewpoints encountered

6. The information literate student validates understanding and interpretation of the information through discourse with other individuals, subject-area experts, and/or practitioners.

Outcomes Include:

- a. Participates in classroom and other discussions
- b. Participates in class-sponsored electronic communication forums designed to encourage discourse on the topic (e.g., e-mail, bulletin boards, chat rooms)
- c. Seeks expert opinion through a variety of mechanisms (e.g., interviews, e-mail, listservs)

7. The information literate student determines whether the initial query should be revised.

Outcomes Include:

- a. Determines if original information need has been satisfied or if additional information is needed
- b. Reviews search strategy and incorporates additional concepts as necessary
- c. Reviews information retrieval sources used and expands to include others as needed

Standard Four

The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.

Performance Indicators:

1. The information literate student applies new and prior information to the planning and creation of a particular product or performance.

Outcomes Include:

- a. Organizes the content in a manner that supports the purposes and format of the product or performance (e.g. outlines, drafts, storyboards)
- b. Articulates knowledge and skills transferred from prior experiences to planning and

creating the product or performance

- c. Integrates the new and prior information, including quotations and paraphrasings, in a manner that supports the purposes of the product or performance
- d. Manipulates digital text, images, and data, as needed, transferring them from their original locations and formats to a new context

2. The information literate student revises the development process for the product or performance.

Outcomes Include:

- a. Maintains a journal or log of activities related to the information seeking, evaluating, and communicating process
- b. Reflects on past successes, failures, and alternative strategies

3. The information literate student communicates the product or performance effectively to others.

Outcomes Include:

- a. Chooses a communication medium and format that best supports the purposes of the product or performance and the intended audience
- b. Uses a range of information technology applications in creating the product or performance
- c. Incorporates principles of design and communication
- d. Communicates clearly and with a style that supports the purposes of the intended audience

Standard Five

The information literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.

Performance Indicators:

1. The information literate student understands many of the ethical, legal and socio-economic issues surrounding information and information technology.

Outcomes Include:

- a. Identifies and discusses issues related to privacy and security in both the print and electronic environments
- b. Identifies and discusses issues related to free vs. fee-based access to information
- c. Identifies and discusses issues related to censorship and freedom of speech
- d. Demonstrates an understanding of intellectual property, copyright, and fair use of copyrighted material

2. The information literate student follows laws, regulations, institutional policies, and etiquette related to the access and use of information resources.

Outcomes Include:

- a. Participates in electronic discussions following accepted practices (e.g. “Netiquette”)
- b. Uses approved passwords and other forms of ID for access to information resources
- c. Complies with institutional policies on access to information resources
- d. Preserves the integrity of information resources, equipment, systems and facilities
- e. Legally obtains, stores, and disseminates text, data, images, or sounds
- f. Demonstrates an understanding of what constitutes plagiarism and does not represent work attributable to others as his/her own
- g. Demonstrates an understanding of institutional policies related to human subjects research

3. The information literate student acknowledges the use of information sources in communicating the product or performance.

Outcomes Include:

- a. Selects an appropriate documentation style and uses it consistently to cite sources
- b. Posts permission granted notices, as needed, for copyrighted material

APPENDIX III

Australian and New Zealand Information Literacy Framework: Principles, standards and practice, 2nd Ed. (Bundy, 2004)

1. The information literate person recognises the need for information and determines the nature and extent of the information needed

1.1 defines and articulates the information need

- explores general information sources to increase familiarity with the topic
- identifies key concepts and terms in order to formulate and focus questions
- defines or modifies the information need to achieve a manageable focus
- may confer with others to identify a research topic or other information need

1.2 understands the purpose, scope and appropriateness of a variety of information sources

- understands how information is organised and disseminated, recognising the context of the topic in the discipline
- differentiates between, and values, the variety of potential sources of information
- identifies the intended purpose and audience of potential resources eg popular vs scholarly, current vs historical
- differentiates between primary and secondary sources, recognising how their use and importance vary with each discipline

1.3 re-evaluates the nature and extent of the information need

- reviews the initial information need to clarify, revise, or refine the question
- articulates and uses criteria to make information decisions and choices

1.4 uses diverse sources of information to inform decisions

- understands that different sources will present different perspectives
- uses a range of sources to understand the issues
- uses information for decision making and problem solving

2. The information literate person finds needed information effectively and efficiently

2.1 selects the most appropriate methods or tools for finding information

- identifies appropriate investigative methods eg laboratory experiment, simulation, fieldwork
- investigates benefits and applicability of various investigative methods
- investigates the scope, content, and organisation of information access tools
- consults with librarians and other information professionals to help identify information access tools

2.2 constructs and implements effective search strategies

- develops a search plan appropriate to the investigative method
- identifies keywords, synonyms and related terms for the information needed
- selects appropriate controlled vocabulary or a classification specific to the discipline or information access tools
- constructs and implements a search strategy using appropriate commands
- implements the search using investigative methodology appropriate to the discipline

2.3 obtains information using appropriate methods

- uses various information access tools to retrieve information in a variety of formats
- uses appropriate services to retrieve information needed eg document delivery, professional associations, institutional research offices, community resources, experts and practitioners
- uses surveys, letters, interviews, and other forms of inquiry to retrieve primary information

2.4 keeps up to date with information sources, information technologies, information access tools and investigative methods

- maintains awareness of changes in information and communications technology
- uses alert/current awareness services
- subscribes to listservs and discussion groups
- habitually browses print and electronic sources

3. The information literate person critically evaluates information and the information seeking process

3.1 assesses the usefulness and relevance of the information obtained

- assesses the quantity, quality, and relevance of the search results to determine whether alternative information access tools or investigative methods should be utilised
- identifies gaps in the information retrieved and determines if the search strategy should be revised
- repeats the search using the revised strategy as necessary

3.2 defines and applies criteria for evaluating information

- examines and compares information from various sources to evaluate reliability, validity, accuracy, authority, timeliness, and point of view or bias
- analyses the structure and logic of supporting arguments or methods
- recognises and questions prejudice, deception, or manipulation
- recognises the cultural, physical, or other context within which the information was created and understands the impact of context on interpreting the information
- recognises and understands own biases and cultural context

3.3 reflects on the information seeking process and revises search strategies as necessary

- determines if original information need has been satisfied or if additional information is needed
- reviews the search strategy
- reviews information access tools used and expands to include others as needed
- recognises that the information search process is evolutionary and nonlinear

4. The information literate person manages information collected or generated

4.1 records information and its sources

- organises the content in a manner that supports the purposes and format of the product eg outlines, drafts, storyboards
- differentiates between the types of sources cited and understands the elements and correct citation style for a wide range of resources
- records all pertinent citation information for future reference and retrieval

4.2 organises (orders/classifies/stores) information

- compiles references in the required bibliographic format
- creates a system for organising and managing the information obtained eg EndNote, card files

5. The information literate person applies prior and new information to construct new concepts or create new understandings

5.1 compares and integrates new understandings with prior knowledge to determine the value added, contradictions, or other unique characteristics of the information

- determines whether information satisfies the research or other information need and whether the information contradicts or verifies information used from other sources
- recognises interrelationships between concepts and draws conclusions based upon information gathered
- selects information that provides evidence for the topic and summarises the main ideas extracted from the information gathered
- understands that information and knowledge in any discipline is in part a social construction and is subject to change as a result of ongoing dialogue and research
- extends initial synthesis at a higher level of abstraction to construct new hypotheses

5.2 communicates knowledge and new understandings effectively

- chooses a communication medium and format that best supports the purposes of the product and the intended audience
- uses a range of appropriate information technology applications in creating the product
- incorporates principles of design and communication appropriate to the environment
- communicates clearly and in a style to support the purposes of the intended audience

6. The information literate person uses information with understanding and acknowledges cultural, ethical, economic, legal, and social issues surrounding the use of information

6.1 acknowledges cultural, ethical, and socioeconomic issues related to access to, and use of, information

- identifies and can articulate issues related to privacy and security in the print and electronic environments
- identifies and understands issues related to censorship and freedom of speech
- understands and respects Indigenous and multicultural perspectives of using information

6.2 recognises that information is underpinned by values and beliefs

- identifies whether there are differing values that underpin new information or whether information has implications for personal values and beliefs
- applies reasoning to determine whether to incorporate or reject viewpoints encountered
- maintains an internally coherent set of values informed by knowledge and experience

6.3 conforms with conventions and etiquette related to access to, and use of, information

- demonstrates an understanding of what constitutes plagiarism and correctly acknowledges the work and ideas of others
- participates in electronic discussions following accepted practices eg Netiquette

6.4 legally obtains, stores, and disseminates text, data, images, or sounds

- understands fair dealing in respect of the acquisition and dissemination of educational and research materials
- respects the access rights of all users and does not damage information resources
- obtains, stores, and disseminates text, data, images, or sounds in a legal manner
- demonstrates an understanding of intellectual property, copyright and fair use of copyrighted material

APPENDIX IV

Table A-1 Literature Review Scoring Rubric (Boote & Beile, 2005)

Category	Criterion			
	1	2	3	4
1. Coverage	A. Justified criteria for inclusion and exclusion from review	Did not discuss the criteria inclusion or exclusion	Discussed the literature included and excluded	Justified inclusion and exclusion of literature
	B. Distinguished what has been done in the field from what needs to be done.	Did not distinguish what has and has not been done	Discussed what has and has not been done	Critically examined the state of the field
2. Synthesis	C. Placed the topic or problem in the broader scholarly literature	Topic not placed in broader scholarly literature	Some discussion of broader scholarly literature	Topic clearly situated in broader scholarly literature
	D. Placed the research in the historical context of the field.	History of topic not discussed	Some mention of history of topic	Critically examined history of topic
	E. Acquired and enhanced the subject vocabulary.	Key vocabulary not discussed	Key vocabulary defined	Discussed and resolved ambiguities in definitions
	F. Articulated important variables and phenomena relevant to the topic.	Key variables and phenomena not discussed	Reviewed relationships among key variables and phenomena	Noted ambiguities in literature and proposed new relationships
	G. Synthesized and gained a new perspective on the literature.	Accepted literature at face value	Some critique of literature	Offered new perspective
3. Methodology	H. Identified the main methodologies and research techniques that have been used in the field, and their advantages and disadvantages.	Research methods not discussed	Some discussion of research methods used to produce claims	Critiqued research methods
	I. Related ideas and theories in the field to research methodologies.	Research methods not discussed	Some discussion of appropriateness of research methods to warrant claims	Introduced new methods to address problems with predominant methods
4. Significance	J. Rationalized the practical significance of the research problem.	Practical significance of research not discussed	Practical significance discussed	Critiqued practical significance of research
	K. Rationalized the scholarly significance of the research problem.	Scholarly significance of research not discussed	Scholarly significance discussed	Critiqued scholarly significance of research
5. Rhetoric	L. Was written with a coherent, clear structure that supported the review.	Poorly conceptualized, haphazard	Some coherent structure	Well developed, coherent

APPENDIX V

References in the data

- Adler, P., & Adler, P. (1994). Observational techniques. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (pp. 377-392). Thousands Oaks: Sage.
- Andreani, O. & Pagnin, A. (1993). Nurturing the moral development of the gifted. In K. Heller, F. Monks, & A. Passow, *International handbook of research and development of giftedness and talent* (pp. 593-553). Oxford: Pergamon Press.
- Ball, D. (1991). Research on teaching mathematics: Making subject-matter knowledge part of the equation. In J. Brophy (Ed.), *Advances in reserach on teaching* (Vol. 2, pp. 1-48). Greenwich: JAI Press.
- Biggs, J. (1996). Western misperceptions of the confucian-heritage learning culture. In D. Watkins & J. Biggs (Eds.), *The Chinese learners: Cultural, psychological and contextual influence* (pp. 45-67). Melbourne: ACER.
- Bleuler, E. (1951). Autistic thinking. In D. Rapaport (ed.), *Organization and pathology of thought* (pp. 199- 437). New York: Columbia University Press.
- Bogdan, R., & Biklen, S. (1992). *Qualitative research for education: An introduction to theory and methods*. Boston: Allyn & Bacon.
- Bowler, D. (2007). *Autism Spectrum Disorder: Psychological theory and research*. Chichester: John Wiley.
- Brooks, R. (1985). Delinquency among gifted children. In J. Freeman (Ed.) *The psychology of gifted children* (pp. 297-308). London: Wiley.
- Brown, C., & Cooney, T. (1982). Research on teacher education: A philosophical orientation. *Journal of Research and Development in Education*, 15(4), 13-18.
- Burgan, M. (2006). *Whatever happened to the faculty?: Drift and decision in higher education*. Baltimore: Johns Hopkins University Press.

- Burgess, H. (2004). Redesigning the curriculum for social work education: Complexity, conformity, chaos, creativity, collaboration? *Social Work Education*, 23(2), 163-183.
- Cai, J. (2000). Mathematical thinking involved in U.S. and Chinese students' solving of process-constrained and process-open problems. *Mathematical Thinking and Learning*, 2(4), 309-340.
- Cauce, A., Reid, M., Landesman, S., & Gonzales, N. (1990). Social support in young children: Measurement, structure, and behavioural impact. In B. Sarason, I. Sarason, & G. Pierce (Eds.), *Social support: An interactional view* (pp. 64-94). New York: John Wiley.
- Chazan, D., & Ball, D. (1999). Beyond being told not to tell. *For the Learning of Mathematics*, 19(2), 2-10.
- Cooney, T. (1985). A beginning teachers' view of problem solving. *Journal for Research in Mathematics Education*, 16, 324-336.
- Correa, C., Perry, M., Sims, L., Miller, K., & Fang, G. (2008). Connected and culturally embedded beliefs: Chinese and US teachers talk about how their students best learn mathematics. *Teaching and Teacher Education*, 24, 140-153.
- Craven, R., Marsh, H., & Burnett, P. (2003). Cracking the self-concept enhancement conundrum: A call and blueprint for the next generation of self concept enhancement research. In H. Marsh, R. Craven, & D. McInerney (Eds.), *International advances in self research* (Vol. 1, pp. 67-90). Greenwich: Information Age Publishing.
- Cross, D. (2009). Alignment, cohesion, and change: Examining mathematics teachers' belief structures and their influence on instructional practices. *Journal of Mathematics Teacher Education*, 12, 325-346.
- Drew, P., & Sorjonen, M. (1997). Institutional dialogue. In T. van Dijk (Ed.), *Discourse and social interaction, Discourse Studies: A multi-disciplinary introduction* (Vol. 2). London: Sage.
- Eggins, S., & Slade, D. (1997). *Casual conversation*. Cambridge: Cassell.

- Ernest, P. (1989). *Mathematics teaching: The state of the art*. Basingstoke: Falmer.
- Fan, L., Chen, J., Zhu, Y., Qiu, X., & Hu, Q. (2006). Textbook use within and beyond Chinese mathematics classrooms: A study of 12 secondary schools in Kunming and Fuzhou of China. In L. Fan, N.-Y. Wong, J. Cai & L. Shiqi (Eds.), *How Chinese learn mathematics: Perspectives from insiders* (pp. 228-261). Singapore: World Scientific.
- Fang, Z. (1996). A review of reserach on teacher beliefs and practices. *Educational Research*, 38, 47-65.
- Frumkin, M., & Lloyd, G. (1995). Social work education. In R. L. Edwards (Ed.), *Encyclopedia of social work (19th ed.)* (pp. 2238-2247). Washington: National Association of Social Workers.
- Fuchs, D., Fuchs, L., Mathes, P., & Simmons, D. (1997). Peer-assisted learning strategies: Making classrooms more responsive to diversity. *American Educational Research Journal*, 34, 174-206.
- Gath, D., Tennenth, G., & Pidduck, R. (1970). Psychiatric and social characteristics of bright delinquents. *British Journal of Psychology*, 116, 515-516.
- Gaudio, R. (2003). Coffee talk: starbuck and the commercialization of casual conversation. *Language and Society*, 32(5), 659-691.
- Geary, D., Bow-Thomas, C., Liu, F., & Siegler, R. (1996). Development of arithmetical competencies in Chinese and American children: Influence of age, language, and schooling. *Child Development*, 67(5), 2022-2044.
- Goodenow, C. (1993). Classroom belonging among early adolescent students: Relationships to motivation and achievement. *Journal of Early Adolescence*, 13, 21-43.
- Greenwood, C., Delquadri, J., & Hall, R. (1989). Longitudinal effects of classwide peer tutoring. *Journal of Educational Psychology*, 81, 371-383.
- Grissett, N., & Norvell, N. (1992). Perceived social support, social skills, and quality of relationships bulimic women. *Journal of Personality and Social Psychology*, 60, 293-299.

- Groth, R. (2005). Linking theory and practice in teaching geometry. *Mathematics Teacher*, 99(1), 27-20.
- Guba, E. (1990). Subjectivity and objectivity. In E. W. Eisner & A. Peshkin (Eds.), *Qualitative inquiry in education: The continuing debate* (pp. 74-91). New York: Teachers College Press.
- Halat, E. (2006). Sex-related differences in the acquisition of the van Hiele Levels and motivation in learning geometry. *Asia Pacific Education Review*, 7(2), 173-183.
- Hartweg, K. (2005). Solutions to the triangular bicycle flags problem. *Teaching Children Mathematics*, 11(9), 466-471.
- Hersh, R. (1997). *What is mathematics, really?* New York: Oxford University Press.
- Hopps, J., & Collins, P. (1995). Social work profession overview. In R. Edwards (Ed.), *Encyclopedia of social work (19th ed.)* (pp. 2266-2282). Washington: National Association of Social Workers.
- House, J. (1981). *Work stress and social support*. Reading MA: Addison-Wesley.
- Ilie, C. (2001). Semi-institutional discourse: the case of talk shows. *Journal of Pragmatics*, 33, 209-254.
- Itakura, H. (2001). Describing conversation dominance. *Journal of Pragmatics*, 33, 1859-1880.
- Jiang, Z., & Eggleton, R. (1995). A brief comparison of the U.S. and Chinese middle school mathematics programs. *School Science and Mathematics*, 95(4), 187-194.
- Kendall, K. (2000). *Social work education: Its origins in Europe*. Alexandria: Council on Social Work Education.
- Kirshner, D. (2002). Untangling teachers' diverse aspirations for student learning: A cross-disciplinary strategy for relating psychological theory to pedagogical practice. *Journal for Research in Mathematics Education*, 33(1), 46-58.

- Lampert, M. (1990). When the problem is not the question and the solution is not the answer: Mathematical knowing and teaching. *American Educational Research Journal*, 27, 29-63.
- Leung, F. (1995). The mathematics classroom in Beijing, Hong Kong and London. *Educational Studies in Mathematics*, 29(4), 297-325.
- Levitt, M., Guacci-Franco, N., & Levitt, J. (1994). Social support achievement in childhood and early adolescence: A multicultural study. *Journal of Applied Developmental Psychology*, 15, 207-222.
- Lipschitz-Elhawi, R., & Itzhaky, H. (2005). Social support, mastery, self-esteem and individual adjustment among at-risk youth. *Child & Youth Care Forum*, 34, 329-346.
- Ma, L. (1999). *Knowing and Teaching Elementary Mathematics: Teachers' Understanding of Fundamental Mathematics in China and the United States*. Mahwah: Lawrence Erlbaum.
- Margolis, E., Soldatenko, M., Acker, S., & Gair, M. (2001). Peekaboo: Hiding and outing the curriculum. In E. Margolis (Ed.), *The hidden curriculum in higher education* (pp. 1-19). New York: Routledge.
- Mesquita, A. (1998). On conceptual obstacles linked with external representation in geometry. *Journal of Mathematical Behavior*, 17(2), 183-195.
- Moon, S. (2004). *GCQ seminal articles: Socio-emotional issues, underachievement, counselling of gifted and talented students*. Thousand Oaks: Corwin Press.
- Naylor, P., & Cowie, H. (1999). The effectiveness of peer support systems in challenging school bullying: The perspectives and experiences of teachers and pupils. *Journal of Adolescence*, 22, 467-479.
- Neihart, M. (2002). Risk and resilience in gifted children: A conceptual framework. In M. Neihart, S. Reis, N. Robinson, S. Moon (Eds.), *The social and emotional development of gifted children* (pp. 41-50). Texas Prufrock Press.
- Oseroff-Varnell, D. (1998). Communication and the socialization of dance students: An analysis of the hidden curriculum in a residential arts school. *Communication*

Education, 47(2), 101-119.

Reis, S., & McCoach, D. (2002). Underachievement in gifted children. In M. Neihart, S. Reis, N. Robinson, S. Moon (Eds.), *The social and emotional development of gifted children* (pp. 41-50). Texas: Prufrock Press.

Richardson, V. (1996). The role of attitude and beliefs in learning to teach. In J. Sikula (Ed.), *Handbook of research on teacher education* (pp. 102-119). New York: Simon & Schuster.

Russell, D., Altmaier, E., & Van Velzen, D. (1987). Job-related stress, social support, and burnout among classroom teachers. *Journal of Applied Psychology*, 72, 269-274.

Schegloff, E. (1999). 'Schegloff's texts' as 'Billig's data': a critical reply. *Discourse and Society*, 10(4), 558-572.

Shulman, L. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4-14.

Shumaker, S., & Brownell, A. (1984). Towards a theory of social support: Closing conceptual gaps. *Journal of Social Issues*, 40, 11-36.

Silverman, L. (2000). *Counselling the gifted and talented*. Denver: Love Publishing Company.

Sternberg, R., & Davidson, J. (2005). *Conceptions of giftedness*. New York: Cambridge University Press.

Stevenson, H., & Stigler, J. (1992). *The learning gap: Why our schools are failing and what we can learn from Japanese and Chinese education*. New York: Summit Books.

Stigler, J., & Perry, M. (1988a). Cross cultural studies of mathematics teaching and learning: Recent findings and new directions. In D. Grouws, T. Cooney, & D. Jones (Eds.), *Effective mathematics teaching* (pp.104-223). Reston, VA: NCTM.

ten Have, P. (1999). *Doing conversation analysis: A practical guide*. London: Sage.

- Terman, L. & Oden, M. (1947). *Genetic studies of genius (Vol. IV): The gifted child grows up*. Stanford: Stanford University Press.
- Thompson, A. (1992): Teachers' beliefs and conceptions: A synthesis of research. In D. A. Grouws (Ed.), *Handbook of research on mathematics teaching and learning* (pp. 127-146). New York: Macmillan.
- Tierney, W. (1995 [1989]). Cultural politics and the curriculum in postsecondary education. In J. G. Haworth & C. Conrad (Eds.), *Revisioning curriculum in higher education* (pp. 35-47). Needham Heights: Simon & Schuster.
- Vallance, E. (1991). Hidden curriculum. In A. Lewy (Ed.), *The International encyclopedia of curriculum* (pp. 40-42). Oxford: Pergamon Press.
- van Hiele, P. (1986). *Structure and Insight*. Orlando: Academic Press.
- Wang, T., & Cai, J. (2007). Chinese (Mainland) teachers' views of effective mathematics teaching and learning. *Identities, Cultures, and Learning Spaces*, 39(4), 287-300.
- Wassef, A., Mason, G., Collins, M., VanHaalen, J., & Ingham, D. (1998). Effectiveness of one-year participation in school-based volunteer-facilitated peer support groups. *Adolescence*, 33, 91-97.
- Watkins, D. (2000). Learning and teaching: A cross-cultural perspective. *School Leadership and Management*, 20, 161-173.
- Watkins, D., & Biggs, J. (1996). *The Chinese learner: Cultural, psychological and contextual influences*. Melbourne: Australian Council for Educational Research.
- Wheeler, B., & Gibbons, W. (1992). Social work in academia: Learning from the past and acting on the present. *Journal of Social Work Education*, 28(3), 300-311.
- Wolff, S. (2004). The history of autism. *European Child & Adolescent Psychiatry*, 13, 201-208.
- Wu, D., Ma, H. (2005). A study of the geometric concepts of elementary school students at van Hiele level one. In H. Chick & J. Vincent (Eds.), *Proceedings of*

the annual conference of the 29th International Group for the Psychology of Mathematics Education (pp. 329-336). Melbourne: PME.

Xie, X., & Carspecken, P. (2008). *Philosophy, learning and the mathematics curriculum: Dialectical materialism and pragmatism related to Chinese and U.S. mathematics curriculums*. Rotterdam: Sense.

Yackel, E. (2002). What we can learn from analyzing the teacher's role in collective argumentation. *Journal of Mathematical Behavior*, 21, 423-440.

Zhu, C., Valcke, M., & Schellens, T. (2008). A cross-cultural study of Chinese and Flemish university students: Do they differ in learning conceptions and approaches to learning? *Learning and Individual Differences*, 18(18), 120-127.